British Medical Journal.

JULY 3RD, 1920.

CONTENTS.

Eighty-eighth Annual Meeting
OF
THE BRITISH MEDICAL ASSOCIATION,
HELD IN
CAMBRIDGE,
June 29th to July 2nd, 1920.

PRESIDENT'S ADDRESS—**The Universities in Medical Research and Practice.** By Sir T. CLIFFORD ALLBUTT, K.C.B., LL.D., M.D., F.R.S. 1

THE SECTIONS.

SECTION OF MEDICAL EDUCATION.

Introductory Address by the President, Sir GEORGE NEWMAN, K.C.B., M.D., F.R.C.P. — The Place of Preliminary Science in the Medical Curriculum 8

Discussion on Preliminary Scientific Education in the Medical Curriculum:—

I. COURSES OF STUDY IN SCIENCE FOR MEDICAL STUDENTS, WITH PARTICULAR REFERENCE TO BIOLOGY. By Professor SYDNEY J. HICKSON, F.R.S. 12

II. ANATOMY. By Professor ARTHUR KEITH, F.R.S., M.D., F.R.C.S. 15

III. PHYSICS. By Professor Sir E. RUTHERFORD, D.Sc., F.R.S. 16

IV. THE RELATION OF THE PRELIMINARY SCIENCE TEACHING TO PATHOLOGY IN THE MEDICAL CURRICULUM. By Professor J. LORRAIN SMITH, M.A., M.D.Ed., F.R.S. 17

V. CHEMISTRY. By Professor ARTHUR SMITHELLS, C.M.G., F.R.S. 19

LEADING ARTICLES.

THE PRESIDENTIAL ADDRESS 22

ANIMAL AND PLANT PATHOLOGY 22

THE WEEK.

The Duke of Connaught, F.R.C.S. 25

Comparative Anatomy of the Teeth 25

Laryngology 25

Pleural Reflex Syncope 26

ANNUAL MEETING NOTES:

1880–1920 24

Dr. J. A. Macdonald 24

"A Concise Guide" 25

Annual Exhibition 25

Sir CLIFFORD ALLBUTT'S PORTRAIT.

Presentation Ceremony at Cambridge. 21

GENERAL ARTICLES AND NEWS.

MOTOR NOTES FOR MEDICAL MEN. By H. MASSAC BUIST:

Left-hand Drive and Char-a banc Problems 27

Why the British Situation is Unique. 27

The Doctor's Case 27

MEDICAL NOTES IN PARLIAMENT:

Financial Position of Voluntary Hospitals 26

Motor Spirit Duty Revenue 26

Part-time Pension Medical Officers 26

Pensions for the Blind 26

Ex-Service Men in Asylums 26

Indian Medical Service Pensions 26

MEDICAL NEWS 31

OBITUARY.

Robert Graves Burton, R.A.M.C.(ret.) ... 30

James Lindsay H. H. Porteous, M.D. 30

LOCAL NEWS.

ENGLAND AND WALES—

Grant to London Hospitals from King Edward's Hospital Fund 28

Southampton Medical Salaries 28

Central Midwives Board 28

CORRESPONDENCE.

Vaccinal Condition of Small-pox Carriers. By Archibald Kidd, M.R.C.S., L.R.C.P. 28

The Army Medical Services in the War. By Colonel P. Broome Giles, A.M.S.(T.F.) 29

A Blind Alley 29

Future Provision of Medical Services. By C. L. Traylen, M.R.C.S., L.R.C.P. 29

MEDICO-LEGAL.

A Doctor's Libel Action 30

A Panel Doctor's Slander Suit 30

UNIVERSITIES AND COLLEGES.

UNIVERSITY OF OXFORD 30

UNIVERSITY OF CAMBRIDGE 30

UNIVERSITY OF LONDON 30

UNIVERSITY OF MANCHESTER 30

UNIVERSITY OF GLASGOW 30

UNIVERSITY OF BELFAST 30

ROYAL COLLEGES OF PHYSICIANS OF IRELAND 30

LETTERS AND ANSWERS.

Income Tax 32

Circumcision 32

Congenital Diaphragmatic Hernia 32

Taenia Voided by the Mouth 32

VACANT APPOINTMENTS 32

The SUPPLEMENT contains:—

ANNUAL REPRESENTATIVE MEETING:

CURRENT NOTES: Finance.—Increase of Annual Subscription.—Medical Federation.—Professional Secrecy.

Full Report of Proceedings on Friday, June 25th, Saturday, June 26th, and Monday, June 28th.

ANNUAL GENERAL MEETING:

Election of President and President-Elect.

381988

INDEX TO ADVERTISEMENT PAGES.

Advertisements are classified so far as date of receipt and printing conditions make possible. Advertisements of the following classes will for the most part be found on the pages indicated :—

UNIVERSITY, HOSPITAL, Etc. VACANCIES—Pp. 37 and 40-44.

ASSISTANTS, PRACTICES, Etc. Pp. 38-40.

MEDICAL SCHOOLS, Etc.—Pp. 35 and 36.

NURSING INSTITUTES—Pp. 41 and 45.

PUBLISHERS—P. i of Cover, also pp. 2-5.

ASSURANCE COMPANIES—Pp. 4 and 29.

BOOTMAKERS, Etc. P. 28.

BRASS NAME PLATES—Pp. 4 and 28.

CHEMISTS, Etc. Pp. 7-27.

DISPENSING BOTTLES—P. 28.

FOOD PREPARATIONS—P. iv of Cover, also pp. 5, 10-27 and 130

MEDICAL AND SURGICAL APPLIANCES—Pp. ii and iii of Cover, also pp. 6 and 26-30.

MOTORS, TYRES, Etc.—Pp. 29 and 30.

SANATORIA AND HOSPITAL BUILDINGS; Etc. P. 4.

PENCILS, TYPEWRITERS, Etc. Pp. 26, 28 and 30.

SANITARY PREPARATIONS—P. 27.

TAILORING AND UNDERWEAR P. 28.

TOBACCO AND CIGARETTES—P. 26.

VACCINE LYMPH—Pp. 6 and 31.

BATHS, SPAS, Etc.—P. 31.

HEALTH RESORTS—P. 34.

HOMES AND ASYLUMS—Pp. 31-34.

HYDROS.—P. 31.

INEBRIETY, Etc.—P. 32.

SANATORIA—P. 35.

SCHOOLS, Etc.—Pp. 35 and 36.

TUTORS AND LECTURERS—P. 35 and 36.

TRANSFER AGENTS—Pp. 45-47.

MISCELLANEOUS—Drs.' A/c Forms—P. 40. Miscellaneous—P. 40.

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INDEX TO VOLUME II FOR 1920.

READERS in search of a particular subject will find it useful to bear in mind that the references are in several cases distributed under two or more separate but nearly synonymous headings—such, for instance, as Brain and Cerebral; Heart and Cardiac; Liver and Hepatic; Renal and Kidney; Cancer and Carcinoma, Epithelioma, Malignant Disease, New Growth, Sarcoma, etc.; Child and Infant; Bronchocele, Goitre, and Thyroid; Diabetes, Glycosuria and Sugar; Light, Roentgen, Radium, *X* Rays; Status Lymphaticus and Thymus; Eye, Ophthalmia and Vision; Bicycle and Cycle; Motor and Automobile; Association, Institution, and Society, etc. Subjects dealt with under various main headings in the JOURNAL have been set out in alphabetical order under their respective headings—for example, "Correspondence," "Leading Articles," "The Week," "Reviews," etc. Original Articles are indicated by the letter (O).

A.

Abdominal crises, acute, diagnosis of (Arthur H. Burgess), 877. (O)
Abdominal operation in 1701, 498
Abdominal pain, chronic (Edward Deanesly), 312. (O)
Abortions (three): pregnancy: treatment with neo-salvarsan: living infant (Delmas), 244
ABRAM, Hill: Excess of cerebro-spinal fluid, 892
Abscess, hepatic (William Oliver Lodge), 399
Abscess, perinephric, subacute, of non-renal origin (Zachary Cope), 509. (O)
Académie de Médecine: Offer of a prize for the best work on orthopaedic surgery, 856—Centenary of, 945
Academy, Royal, winter exhibition, 725
Academy, Royal, of Medicine in Ireland;—*Section of Obstetrics and Gynaecology:* President's address on recent progress in obstetrics, 892
Aceto-salicylic acid, sale of forbidden in Argentina except when prescribed by a physician, 296
Aceto-salicylic acid causing acute ulcerative stomatitis (Hubert C. Bristowe), 399
Acetyl-p-aminophenyl stibiate of sodium in human trypanosomiasis and kala azar (Philip Manson-Bahr), 235 - Discussion, 236
Acidosis in disease (F. Gowland Hopkins), 69—(W. M. Bayliss), 72—(H. H. Dale), 72—(T. H. Milroy), 72—(E. P. Poulton), 72, 190—(T. R. Parsons), 73—Discussion, 73—A correction, 190
Acladiosis, Castellani's (R. W. Mendelson), 664
ACTON, Major H. W.: Quinine in pharmacology and therapeutics, 117
ADAM, C.: *Taschenbuch der Augenheilkunde für Aerzte und Studierende*, rev., 595
ADAMI, J. G.: Cancer research, 658
ADAMS, Francis, a great general practitioner, 673
ADAMS, John: Latent syphilis in pregnancy, 784
ADAMS, Joseph E.: Treatment of cutaneous erysipelas with brilliant green, 779. (O)
ADAMSON, H. G: Treatment of lupus vulgaris by liquid acid nitrate of mercury, 123. (O)—Letter on, 224
Adenoid and tonsil operations, anaesthesia in (Courtenay Yorke), 318. (O)—Correspondence on, 413, 455
Adenoid and tonsil operations in outdoor clinics, risks of (E. Watson-Williams), 887. (O)—Correspondence on, 951, 990
"Adminson Limited" (experimental apiary), 994
Admiralty fees. *See* Fees
Adrenalin, action of on the bronchioles (W. E. Dixon), 242
Adrenalin injections, cardio-vascular response to, 486
Adrenals, effect of certain dietary deficiencies on, 867
ADRIAN, E. D.: Treatment of denervated muscle, 242
Advertisements of practices. *See* Practices
Aerophagy, 794
Africa, Central, Mackie expedition to, 915
AGAR, Morley: Method of treating hay fever and paroxysmal rhinorrhoea, 125 (O)
Agriculture and Fisheries Ministry: Report of chief veterinary officer, 755—Rabies in England, 755
Air Force, Royal, information concerning the medical service of, 375
Air mails, 458
Air navigation, medical requirements of (Martin Flack), 593
Air sickness, review of books on, 401
Air transport, 674
Air. *See also* Aviation *and* Flying
"A la suite" officers in Territorial hospitals. *See* Hospitals
ALCOCK, Reginald: Venereal disease in women and children, 201
Alcohol Congress. *See* Congress.
Alcohol, fatigue, and mental activity, 710
Alcohol, influence of dilution on the toxicity of (H. M. Vernon), 638 - Correspondence on, 722
Alcohol and venereal disease, 756
Alcoholic strength measured in proof spirit (parliamentary question), 27
ALDER, Noel: An adjustable stethoscope, 941
ALDERSON, Reginald: Earache due to larvae in the external auditory meatus, 319
Algeria blindness in, 647
ALLAN, George A.: An abdominal operation in 1701, 498
ALLBUTT, Sir Clifford: Presidential address on the universities in medical research and practice, 1. (O)—Presentation of his portrait, 21, 141—Pleural reflex syncope, 255
ALLEN, John (and D. R. WOOD): Diphtheria carrier of unusual type, 818 (O)
ALLISON, T. M.: Calcium in treatment of tuberculosis, 187
Alsace and Lorraine, conditions for German doctors to practise in, 686
Alvarenga Prize for 1921, 441, 771
Ambidexterity, prize for best training of pupils in, 145
Ambulance service, the home, 866
Ambulance stations in England and Wales, and Ireland: Handbook showing addresses, 526
Ambulances, home, 287, 866
American Association of Genito-Urinary Surgeons, *Transactions*, 250
American graduates in Europe, London's opportunity, 492. *See also* Post-graduate school
American Journal of Obstetrics and Gynecology to take the place of the *American Journal of Obstetrics and Diseases of Children*, 403
American view of the national insurance scheme (leading article), 444
Ampoule syringes, 942
Amsterdam, increase in number of cases of encephalitis lethargica, 139
Anaesthesia, resuscitation in death under (Welby Earle Fisher), 698. (O). *See also* Gas, nitrous oxide
Anaesthesia, first operation under, 771
Anaesthesia, intratracheal, by the nasal route, for operations about the mouth and lips (Stanley Rowbotham), 590. (O)
Anaesthesia, intratracheal, forceps for, 670
Anaesthesia, obstetric, with pituitrin, in placenta ablata (J. Lind Smith), 936
Anaesthesia, psychology of (Dudley W. Buxton), 859
Anaesthesia, review of books on, 440, 517, 669
Anaesthesia in tonsil and adenoid operations (Courtenay Yorke), 318. (O)—Correspondence on, 413, 455
Anaesthetic fees. *See* Fees
Anaphylaxis, capillary poisons and shock (leading article), 791
Anatomical Institute, scope and equipment of (G. Elliot Smith), 67 (O)
Anatomy in medical education (Arthur Keith), 15
Anatomy, nasal, collection of, 755
Anatomy, review of books on, 281, 479, 480, 634, 895
ANDERSON, D. E.: *Filaria bancrofti* and elephantiasis, 234
ANDERSON, D. Lechmere: Miner's nystagmus, suggestions for its prevention, 813. (O)
ANDERSON, J. Barcroft: Dietetic deficiency and endocrine activity, 238
Anderson's College. *See* College
ANDREWES, Sir Frederick: Harveian oration on the birth and growth of science in medicine, 615. (O)
ANDREWS, the late Captain Henry John, Victoria Cross awarded to, 456—Appreciation of, 769
ANDREWS, H. Russell (and COMYNS BERKELEY and J. S. FAIRBAIRN): *Midwifery*, rev., 787
Anencephalic syndrome in relation to apituitarism (F. J. Browne), 828
Aneurysm, traumatic, of the second and third parts of the right subclavian artery treated by ligature of the first part of (D. W. Hume), 243. (O)
Angina, faucial, 262
Angina pectoris, surgical treatment of, 793, 840. 991
Anglo-American University Library for Central Europe, 924
Animal experiment and tropical medicine (Sir Leonard Rogers), 984
Animal experiments and surgery, review of books on, 209
Animal and plant pathology (leading article) 22
Animals, experiments on (parliamentary question), 220—In 1919, report of chief inspector, 523—In California: Bill to prohibit, 749, 794, 924
Annals of Medical History, rev. 166
Annual Charities' Register and Digest, rev., 824
Annual meeting *See* Association
Anopheles plumbeus and malarial infection, 697
Anoxaemia (J. Barcroft), 329
Antenatal death (Arthur Robinson), 985
Anthrax, death from in Southwark (parliamentary question), 137—Deaths from in Chicago, 145
Anthrax treatment (G. C. E. Simpson), 821
Anthrax treated with normal ox serum (leading article), 865—Correspondence on, 952
Anthropological Institute (International) founded at Paris, 630
Antimony in bilharzia, 256, 854. 890
Antimony in kala-azar, 453, 610, 645
Antimony in leprosy (F. G Cawston), 76, 855. (O)—Correspondence on, 498. *See also* Tartar emetic
Antimony tartrate, action of in intravenous injections (J. B. Christopherson), 854 (O), 937
Antimony tartrate (sodium), superiority of to emetine in bilharzia (A. H. Harkness), 890
Antimony tartrate in ulcerating granuloma of the pudenda (H. Lovett Cumming), 775. (O)
Antipyrin causing acute ulcerative stomatitis (Hubert C. Bristowe), 399—Correspondence on, 498
Antiscorbutic fruit juices, dried, 250
Antituberculosis compaign in Kent, 490. *See also* Tuberculosis campaign
Antityphoid inoculation during an epidemic (A. Romanes and G. G. Johnstone), 932. (O)
Antivivisection (Sir George Kekewich), 675
Antivisection in America, 749, 794, 924
Apiary, experimental, 994
Apothecaries' Hall of Ireland: Information concerning the study of medicine, 353
Apothecaries' Society of London: Pass lists, 336—Information concerning the study of medicine, 349
Appendicitis, acute, accompanying lobar pneumonia (L. Firman-Edwards). 477
Appendicitis, causation of (Rendle Short). 979
Appendix, rabbit-shot in (D. Leigh Spence), 320—(R. H. Hall), 664
Appendix and the *x* rays (R. Allan Bennett), 316 (O)
ARBULÚ, J. Guillermo: Nomenclature of diseases, 843, 865
ARCHDALE, Mervyn Alexander: Dementia praecox, 473
ARCHER-HALL, H. W.: Optic neuritis due t dental sepsis, 39

Archives de médecine expérimentale et d'anatomie pathologique ceases publication, 260
Archivos Dermosifiliograficos y Revista practica de la especialidad, foundation of, 279
Argentine, sale of aceto-salicylic acid forbidden in except when prescribed by a physician, 296
ARKWRIGHT, Joseph A.: Bacteriology of cerebro-spinal meningitis, 420
ARMSTRONG, W. H. Stirling: Inflammable gas as a product of fermentation in malignant disease of stomach, 477
ARMSTRONG-JONES, Sir Robert: Psychological analysis, 410

ARMY, BRITISH:
Appointments in the medical service of, 380. *See also* Supplement Index
Appointment of D.A.D.M.S. East Anglian Division, 95
Appointments, 260
Auxiliary R.A.M.C. Funds, 844
Information concerning the medical service of, 373
Officers (parliamentary question), 796
Parliamentary questions, 714, 796
Pay and retired pay of R.A.M.C. officers, 613, 796
R.A.M.C. resignations (parliamentary question), 714
R.A.S.C. Memorial Fund, 993
Temporary R.A.M.C. commissions, 414

Army, British: Queen Mary's Army Auxiliary Corps, 380. *See also* Supplement Index
Army, British: Territorial Force Reserve, 380. *See also* Supplement Index
Army Council constitution (parliamentary question), 290—Correspondence on, 333, 411
Army Council instruction *re* half-pay officers who require medical treatment for disabilities, 414
Army huts for temporary houses (parliamentary question), 92

ARMY, INDIAN:
Appointments, etc., 380. *See also* Supplement Index
Correspondence on the medical services, 608, 842
Future of (parliamentary question), 92
Information concerning the medical service of, 375
Invalid pensions for Indian army officers (parliamentary question), 254
Leading article on the medical services, 555
Pensions, medical (parliamentary question), 26
Reports of committees (Lovett, 560; Esher, 561).—Proposed Indian Medical Corps, 560
Text of letter to British Medical Association, 142
Text of press communiqué issued from India Office, 142

Army medical service and its relation to the training of newly qualified medical men (Colonel Joseph Griffiths), 965
Army medical services in the war, 29
Army Order *re* pay and retired pay of R.A.M.C. officers, 613
Army sanitation headquarters (parliamentary question), 92
Army, United States, chronic arthritis in, 983
Arrhénal in typhus, 458
Arsenic in inoperable cancer, 645
Arsine poisoning (M. Bannister) 476. (O)
Arterio-sclerosis, review of books on, 479
Artery, right subclavian, ligature of the first part of for traumatic aneurysm of the second and third parts (D. W. Hume), 243. (O)
Arthritis, acute, of hip-joint (S. T. Irwin), 320
Arthritis, chronic, in the United States Army, 983
Arthritis, review of books on, 281
Arthritis, rheumatoid, climate in, 497, 572, 614
Arthritis, rheumatoid, treated by vaccines (H. Warren Crowe), 815. (O)
Artificial limbs: Cost of (parliamentary question), 27—Supply of (parliamentary question), 137—For pensioners, standardized, 225—For demobilized officer who cannot provide for his own support (parliamentary question), 291—Regional directors appointed by Pensions Ministry, 646—Choice of (parliamentary question), 913—Leading article on, 943—New (parliamentary question), 986
Ascaris lumbricoides, life-history of (F. H. Stewart), 818. (O)
Ascites treated by drainage (Sir John O'Conor), 857. (O)
Asepsis in midwifery. *See* Midwifery
ASHDOWN, George W. W., obituary notice of, 921
ASHE, E. Oliver: Tennis elbow, 534
ASKANAZY: Coexisting primary malignant tumours, 488
Aspirin poisoning: Case of caused by 2½ grains, 300—Case caused by 10 grains, 418
Assistant Surgeons' Conference (Indian), 871
Assizes: Fees for witnesses. *See* Fees
Association, American Child Hygiene, 922
Association, American Dietetic, 613
Association of Blind Masseurs, 457

Association, British: Meeting at Cardiff, 328—Karl Pearson: A pure race, 328—J. Barcroft: Anoxaemia, 328—Thomas Lewis: The relation of physiology to medicine, 459—Stanley Gardiner: The beginnings of life, 982
Association, British Dental: Annual Conference, 251
Association, British Hospitals: Sir Napier Burnett: Voluntary and municipal hospitals, 638—Conference on voluntary hospitals, 899
Association, British Medical: Annual meeting at Cambridge, 1920—Notes on the meeting, 24, 60—1880-1920, 24—Dr. J. A. Macdonald, 24—"A Concise Guide," 25—Annual exhibition, 25—Leading article, 58—Honorary degrees, 60—Receptions at Cambridge, 60—Church services, 61—Rooms in college, 61—Temperance breakfast, 61—Irish graduates' luncheon, 62—Section of surgery, 91—Popular lecture, 91
Association, British Medical, in 1920 (leading article), 905
Association, British Medical: 89th annual meeting (1921) at Newcastle-upon-Tyne, 902

ASSOCIATION, BRITISH MEDICAL:
Bath and Bristol Branch.—Meeting *re* future provision of medical services, 83
Oxford and Reading Branch.—Clinical meeting and exhibition of cases, 208—J. L. Joyce: Acute intestinal obstruction, 208—G. R. Girdlestone: Organized treatment of crippled children, 208
Victorian Branch.—Battle of the lodges, 765—Post-graduate classes, 765
Willesden Division.—Lord Dawson of Penn:—Address on the report of the Consultative Council on Medical and Allied Services: The future of medical practice, 750

Association, British Medical: Proposed reorganization of the work of, 872. *See also* Liberty and economy

ASSOCIATION, BRITISH MEDICAL: SECTIONS AT THE ANNUAL MEETING:
Electro therapeutics.—Summary of proceedings, 57—Report of proceedings, 385, 535
Medical Education.—Summary of proceedings, 56—Report of proceedings, 8, 73
Medical Sociology.—Summary of proceedings, 57—Report of proceedings, 33
Medicine.—Summary of proceedings, 47—Report of proceedings, 147, 301, 499
Naval and Military.—Summary of proceedings, 54—Report of proceedings, 965
Neurology and Psychiatry.—Summary of proceedings, 49—Report of proceedings, 470, 619, 691, 781
Obstetrics and Gynaecology.—Summary of proceedings, 54—Report of proceedings, 263, 535
Obstetrics and Gynaecology and Electro-therapeutics.—Report of proceedings, 535
Pathology and Bacteriology.—Summary of proceedings, 50, 57—Report of proceedings, 419, 581, 653
Physiology and Pharmacology.—Summary of proceedings, 52—Report of proceedings, 69, 113, 239
Surgery.—Summary of proceedings, 48, 91—Report of proceedings, 99, 160, 462, 730, 962
Tropical Medicine.—Summary of proceedings, 55—Report of proceedings, 231
Venereal Diseases.—Summary of proceedings, 56—Report of proceedings, 194

Association, British Motor Cycle and Cycle Car Research: Granted a licence by the Board of Trade, 845
Association, British Orthopaedic: Elects King Manuel as honorary member, 65—Special meeting, 320—R. C. Elmslie: Principles of correction of congenital talipes equino-varus and particularly of inveterate and relapsed cases, 320—John Fraser: Treatment by tendon transplantation of paralysis involving the ankle-joint, 320—S. T. Irwin: Acute arthritis of hip-joint, 320—Mark Jansen: Feebleness of growth, 320—Dysostosis cleido-cranialis, 320—Hey Groves: Vital and mechanical principles of bone grafting, 320—Demonstrations, 320, 321—M. Forrester-Brown: Possibilities of end-to-end suture in extensive injuries of peripheral nerves, 320—Annual meeting, 640
Association, Invalid Children's Aid: Joint conference with Committee for Care of Cripples, 227, 837
Association, King Edward VII Welsh National Memorial, 311
Association, London Medical Women's Federation:—Janet Campbell: Ministry of Health, 126—Margaret Dobson: Eye injuries, 979—Progressive myopia, 979
Association, Lucknow Medical, and the Esher and Lovett reports, 871
Association, Medico-Psychological of Great Britain and Ireland: Annual meeting, 321—W. G. Thomson: Minimal requirements for a small clinical laboratory, 321—Dr. Middlemass: Hospital routine examinations, 321—Dr. Menzies: Involuntary melancholia, 321—W. H. B. Stoddart: Psychological analysis, 322—Discussion, 322—Tom Williams: Determinants of morbid emotionalism, 322
Information concerning, 371—W. Robinson Future of service patients in asylums, 893
Association, Metropolitan Public Gardens, seeks to resume its pre-war work, 846
Association for Prevention of Tuberculosis: Annual conference, 217, 526, 558—British Medical Association's delegates, 526. *See also* Tuberculosis prevention
ASTEN, Walter: Consultative Council's report, 803
Asylum and hospital accommodation in London, 255
Asylum, Prestwich County, Manchester, condition of ex-service men in, 875
Asylum war hospitals. *See* Hospitals
Asylums, ex-service men in (parliamentary question), 26, 796
Asylums, future of service men in (W. Robinson), 893
Ataxia and mental defect, with hereditary spastic paraplegia (J. S. Manson), 477
ATHANASIO-BENISTY, Mme.: *Les Lésions des Nerfs, Traitement et Restauration*, rev., 595
Athena: A Yearbook of the Learned World, rev., 634
ATKIN, Lord Justice: Medicine and the law, 747, 910, 946
Atlas, pathological dislocation of (F. Strong Heaney), 744
Atropine in sea-sickness, 190
AUDEN: G. A.: Institutions for mentally defective, 212
AULD, A. G.: Function of mucus, 681—Intravenous peptone therapy in epilepsy, 840

AUSTRALIA:
Adelaide University, 255
Battle of the lodges in Victoria, 765
Children and the slums, 492
Federal Medical Officers' Relief Fund, 255
Influenza in Melbourne in 1919, 951
Lodge practice, 333
Medical Congress, 763, 914
Nationalization of hospitals, 333
New Medical Act, 255
New professorships at Sydney University, 491
Post-graduate classes in Victoria, 765
Prince of Wales in, 603
Resignation of Professor Wilson, 491
Soldier students, 333
Tropical, colonization of, 763, 914
Universities conference, 491
See also New South Wales

Austria: Many neo-salvarsan preparations found to contain no salvarsan, 123—Letter to professors from Oxford Unversity, 647—Tuberculosis in (leading article), 829
Austrian children, hospitality to (parliamentary question), 291
Auto-haemagglutination (C. J. Bond), 925, 973. (O)
Auxiliary R.A.M.C. Funds. *See* Army, British, *and* Funds
Aviation: Medical problems of (leading article), 443—Medical requirements for (Martin Flack), 593. *See also* Flying *and* Air
Ayerza's disease, 487, 658. *See also* Polycythaemia rubra
AYZER, Captain V. R. Sundaresa: A triorchid, 498

B.

B. tetani, the omnipresent (infant's death from), 985
Babies, judging, 146
BABONAU, Major Alexander Frederick, C.I.E. conferred upon 260
BABTIE, Sir William, death of, 448—Obituary notice of, 494
Baby Week Council, new address, 571
Bacteriology, review of books on, 788
Bacteriuria (Chalmers Watson), 820
BADALONI, Nicola, made a Roman Senator, 771
BAIRD, W. J.: Research and the general practitioner, 261
BAKETEL, H. S.: *Treatment of Syphilis*, rev., 940
BALFOUR, Andrew: Treatment of human trypanosomiasis and kala-azar by intravenous injections of acetyl-p-aminophenyl stibiate of sodium, 236—Kala-azar in Mesopotamia, 335—Emetine in bilharziasis, 681—Tropical fleas, 954
BALGARNIE, W.: Two cases of intestinal tumour, operation, recovery, 629. (O)
BALLANCE, Sir Charles: Treatment of calculi impacted in pelvic portion of ureter, 163—Bradshaw Lecture on surgery of the heart, 523
BALLANCE, Sir Hamilton: Surgical treatment of cancer of rectum, 742
BALLANTYNE, J. W., elected an honorary member of the American Child Hygiene Association, 922
BANA, F. D.: Faucial angina, 262; menstruation during school life, 924

BANDELIER, Dr. (and Dr. ROEPKE): *Lehrbuch der Spezifischen Diagnostik und Therapie der Tuberkulose*, rev., 632
BANKS, H. Stanley (and Basil HUGHES): Immediate surgical complications of dysentery, 934. (O)
BANNISTER, M.: Poisoning by arsine, 476 (O)
Bar, call to the, information concerning, 708
Barcelona, Biological Society of: *Treballs de la Societat de Biologia*, rev., 400
BARCROFT, J.: Anoxæmia, 329
BARCLAY, Alfred Ernest: Place of the radiologist in medicine, 385
Barium carbonate, administered in error, causes two deaths at St. Leonard's-on-Sea, 296
BARLOW, H. Cecil: Healing of a trophic ulcer of the great toe in an aged glycosuric patient, 124. (O)
BARNES, Dr.: Treatment of glycosuria and diabetes, 786
BARNES, Henry: The Carlisle experiment in liquor control, 185—Presentation to, 866
BARR, Sir James: Vitamines in clinical medicine, 150—Immanuel Kant, 685
BARRÉ, J. A. (and Georges GUILLAIN): *Travaux neurologiques de Guerre*, rev., 324
BARRIS, Dr.: Primary carcinoma of Fallopian tube, 165
Barristers, medical, 31, 845
BARTON, G. A. H.: *Backwaters of Lethe*, rev., 440
BARTON, S. Saxon: Treatment after colotomy, 417
BARTON, William Paul Crillon, a pioneer in American naval medicine, 90
Basal ganglia. *See* Ganglia
BASKETT, B. G. M.: Government subsidies and the national health, 682
BASSET, Antoine: *Annales de la Clinique Chirurgicale du Professeur Pierre Delbet, No. 7, Les Fractures du Col de Fémur*, rev., 939
BASSETT-SMITH, Surgeon-Captain: *Filaria bancrofti* and elephantiasis, 234—Dietetic efficiency and endocrine activity, 238
BASSINI, Edoardo, retirement of, 227
Battle of the lodges in Australia, 765. *See also* Australia
BAYLISS, W. M.: Acidosis in disease, 72
BAYLY, H. Wansey: Wassermann reaction, 224—Mortality of venereal disease, 454
BEAR, Beatrice E.: *British System of Physical Education*, 712
BEATSON, William, awarded Royal Medal of Royal Society, 867
BECHHOLD, H.: *Colloids in Biology and Medicine*, rev., 210
Bedpan with straight sides, 457
Bee and wasp stings, 924
Beekeepers' journal, *Bee World*, 994
Beginnings of life (leading article), 982
Beit Fellowships awarded, 942
Belfast: Recent riots in, 185—Tuberculosis in, 764—Chairs of gynaecology and obstetrics, 800—Report of Tuberculosis Department, 985
Belgium: First independent urological clinic inaugurated at Liége, 417—Memorial to medical men to be erected in Brussels, 685
BELL, Alexander: The inventor of the telephone, 908
Belt, obstetrical, 211
Bengal, infant deaths in, 765
BENNETT, R. Allan: *X* rays and the appendix, 316. (O)
BENNETT, T. Izod: Diagnosis of nervous disorders of stomach and intestine, 503—(and J. F. VENABLES): Effects of the emotions on gastric secretion and motility in the human being, 662. (O)—Elected to a Beit Fellowship, 942
BENTHAM, Ethel, appointed J.P. for London, 144
Benzyl compounds, therapeutics of, 406
Bequests to hospitals and medical charities, 416, 863, 942
Beri-beri: Value of legumes in, 66—Diminution of in the Federated Malay States, 942
BERKELEY, Comyns: *Handbook of Midwifery*, rev., 705—(and H. RUSSELL ANDREWS and J. S. FAIRBAIRN): *Midwifery*, rev., 787—(and VICTOR BONNEY): *The Difficulties and Emergencies of Obstetric Practice*, rev., 787
BERNE-LEGARDE: Forgotten compresses in the bladder, 487
BERRY, Richard A., appointed Stewart lecturer for 1921 in Melbourne University, 90
BESREDKA: New conceptions regarding immunity to the enteric fevers, 325, 402, 404
BEVEN, J. O.: Rupture of vein of dermoid cyst: intraperitoneal haemorrhage: operation: recovery, 243. (O)
BICKLE, Lieut.-Col. Leonard W.: The Prince of Wales in Australia, 603—Puerperal sepsis, 802
BIDDLE, E.: Engine starting, 146
BIFFIN, R. H., awarded Darwin medal of Royal Society, 867
BIGLAND, A. D. and P. M.: Cerebro-spinal fluid examinations, 786
Bilharzia, antimony in, 256, 854, 890, 937
Bilharzia, superiority of sodium antimony tartrate to emetine in (A. H. Harkness), 890
Bilharziasis, emetine in, 645, 681
BILLINGTON, C. M.: Volvulus of the whole of the small intestine, 549
BILLINGTON, William: Surgical treatment of gastric ulcer, 107
Biology in medical education (Sydney J. Hickson), 12
Biology, review of book on, 745
Birmingham, report of Special Schools After-care Committee on Mentally Defectives, 205—Annual report of tuberculosis officer, 886
Birth rate: Of Sydney, 185—Of the world, increase of, 675
Birth rate, fall in (G. Udny Yule), 671—Leading article on, 672
Births registered in England and Wales in the first quarter of 1920 (parliamentary question), 27
Births, registration of in Scotland (parliamentary question) 64
BISHOP, H. D.: Tuberculous milk, 682—Tuberculosis in Guernsey, 920
Bishops' dilemma, 524
BLACK, Harold: *X*-ray diagnosis of tumours of thorax, 395
BLACK, Major: *Filaria bancrofti* and elephantiasis, 234
BLACKHALL-MORISON, Alexander: Surgical treatment of angina pectoris, 840
BLACKHAM, Col. Robert J.: Dried milk dietetics, 412—(and Captain T. H. BLAKE) The regimental medical officer, his powers and duties, 971
BLACKLEY, F. J.: State and future of the medical profession, 46—Appointed Regional Medical Officer of Ministry of Health, 771
BLACKLOCK: *Anopheles plumbeus* may become infected with malarial parasite, 697
Blackwater fever. *See* Fever
Bladder, forgotten compresses in, 487
BLAIR, David: Dementia præcox, 475
BLAIVAS, A. J. (and R. B. H. GRADWOHL): *The Newer Methods of Blood and Urine Chemistry*, rev., 746
BLAKE, Captain T. H. (and Colonel R. J. BLACKHAM): The regimental medical officer, his powers and duties, 971
BLAND-SUTTON, Sir John: *Selected Lectures and Essays*, rev., 77
BLANE, Sir Gilbert, 710
BLAXLAND, A. J.: Gall stones and infusions, 293
BLEASE, Arthur T.: Myopia, 262
Blepsopathia or eye-strain (H. A. Des Vœux), 938
Blind alley, 29, 64, 258
Blind, pensions for (parliamentary question), 26
Blind Masseurs' Association, 457, 768, 804
Blind masseurs, appeal to medical men, 768, 804
Blind Persons Bill, 291
Blind students, training of, 567
Blind, welfare of, Advisory Committee's report, 524—Departmental Committee set up by Ministry of Health, names of members, 526—Training of blind students, 567
Blindness, prevention of (India), 607
Blindness in the Sahara, Algeria, and Tunis, 647
Blood pressure in Graves's disease (J. Strickland Goodall and Lambert Rogers), 588. (O)
Blood transfusion (J. M. Graham), 820
Blood transfusion, demonstration on (Arthur Cooke and J. W. McNee), 111
Board, Central Midwives, 28, 185, 647, 922
Board, Central Midwives (Ireland), 185, 764
Board, Central Midwives (Scotland), 798
Board of Control and right to claim pauper patients (parliamentary question), 913
Board of Education: New address of, 97—And a post-graduate school (leading article), 483—Consolidated regulations *re* Special services of elementary education, 526—Issues books on physical training for schools, 711—Annual report of Chief Medical Officer, 761, 791, 826
Board, Food Investigation: Report on frozen fish, 910
Board, Local Government, officers' superannuation (parliamentary question), 714
Board, Metropolitan Asylums, accounts of (parliamentary question), 913
BODMAN, Dr: Quinine in pharmacology and therapeutics, 121
Bogus doctor sentenced (Mellor), 456
BOLAM, R. A. (and R. ORDE): Industrial hospitals, 835
BOLT, R. F.: Intolerance of calomel, 245
Bombay: Proposed school of tropical medicine, 957
BOND, C. J.: Auto-haemagglutination, 925, 973. (O)
Bone grafting (Hey Groves), 320
Bonesetters *versus* the science and art of surgery, 222, 256, 300
BONNEY, Victor: Puerperal sepsis, 263—New operation for kidney fixation, 744—(and Comyns BERKELEY): *The Difficulties and Emergencies of Obstetric Practice*, rev., 787
BORDEL, E. (and H. VAQUEZ): *Radiologie des vaisseaux de la base du coeur*, rev., 896
BORDET, Jules: *Traité de l'Immunité dans les maladies infectieuses*, rev., 167—Awarded Nobel prize for 1919, 713
Borough coroners. *See* Coroners
BORRADAILE, L. A.: *Manual of Elementary Zoology*, rev., 668
BOULTON, Lieut.-Col. Harold, C.B.E. conferred upon, 260
BOURNE, Aleck W.: Pituitary extract in obstetrics, 146—Asepsis in midwifery, 991
Bovesco, 551
BOWER, F. O.: Preliminary science in the medical curriculum, 75
BOWSER, J. Edward: Treatment of fractures, 292
BOYCOTT, A. E.: Preliminary science in the medical curriculum, 76
BOYD, E. J.: Bedpan with straight sides, 457
BOYLE, Helen: Dementia præcox, 475—Early symptoms in nervous disease, 696
BRACKENBURY, H. B.: The State and the future of medical practice, 46—Future of consultants, 64—Preliminary science in the medical curriculum, 75—War physical census, 452
BRACEY, W. Edelsten: Longevity in Somerset, 146
BRADFORD, May: *A Hospital Letter-writer in France*, rev., 634
Bradford scheme for municipalization of hospitals, 527, 552, 643—Leading article on, 753—Correspondence on, 766. *See also* Hospitals, municipalization of
BRADLEY, O. Charnock: *Topographical Anatomy of the Limbs of the Horse*, rev., 596
Bradshaw lecture. *See* Lecture
BRAHMACHARI, Upendra Nath: *Kala-azar and its Treatment*, rev., 324—Use of antimony in leprosy, 498
BRAINARD, Annie M.: *Organization of Public Health Nursing*, rev., 941
BRAMWELL, William: Early symptoms of nervous disease, 800
Bread, sale of by weight, Interdepartmental Committee appointed, 885
BREINL, Dr., resignation of from Townsville Institute of Tropical Medicine, Queensland, 145
BRESSLAU, E.: *Mammary Apparatus of the Mammalia in the Light of Ontogenesis and Phylogenesis*, rev., 283
BRIGGS, Henry: Obstetric and gynaecological education, 229. (O)—Spoon-shaped depressed fracture of the right frontal bone treated by elevation, 665—The female pelvic floor, 665
Brilliant green in treatment of cutaneous erysipelas (Joseph E. Adams), 779. (O)
BRIMBLECOMBE, S. L.: Transposition of viscera in two members of one family, 889
BRINDLEY-JAMES, J.: Death certificates and coroners' courts, 412
BRISCOE, John Fredk.: Mortality of venereal diseases, 257
BRISSEAU, Michel, monument to, 662
Bristol: Meeting *re* future provision of medical services, 83
BRISTOW, Rowley: Results of peripheral nerve injuries treated by operation, 469
BRISTOWE, Hubert C.: Acute ulcerative stomatitis caused by drugs, 399
British and American surgeons, 597, 599. *See also* College of Surgeons of America
British colonies, information concerning conditions of practice in, 377
British Empire Exhibition, London (1923), 379
British Guiana. *See* Guiana
British Hospital. *See* Hospital
British Hospitals Association. *See* Association
British Medical Association. *See* Association
British Motor Cycle and Cycle-car Research Association granted a licence by Board of Trade, 845
British Orthopaedic Association. *See* Association
British research chemicals, 686
British Spa Conference: Meeting at Harrogate, 571
Brixton, outbreak of food poisoning at, 286
BROAD, W. H.: Muscle re-education in infantile paralysis, 768
BRODERICK, F. W.: Effect of endocrine derangement on the teeth, 867
Bromoform poisoning: Recovery from (William B. Watson), 702—Treatment of (F. W. Burton-Fanning), 783
Bronchioles, action of adrenalin on (W. E. Dixon), 242
BROOKE, G. E.: *Medico-Tropical Practice: A Handbook for Medical Practitioners and Students*, rev., 746
BROOKMAN, H.: Fatal hepatic cirrhosis in a young man, 208
BROOKS, Harlow (and Robert Holmes GREENE): *Diseases of the Genito-urinary Organs and the Kidney*, rev., 633
BROSTER, Major L. R.: Medical aspects of war tanks, 909
BROWDY, M. W.: Treatment of gonorrhœa in women, 295, 454—Gonorrhœal mastitis, 843
BROWN, Herbert H: Surgical treatment of cancer of rectum, 739
BROWN, Horace T., awarded Copley medal of the Royal Society, 867
BROWN, John: Vitamines in clinical medicine, 160
BROWN, J. Macdonald, appointed chairman of the Hampstead bench of magistrates, 805
BROWN, J. W.: Fertility of the English middle classes, 672
BROWN, Maud F. Forrester: Results of operations for nerve injuries at the Edinburgh War Hospital, 467
BROWN, Thomas R.: Diagnosis of nervous disorders of stomach and intestine, 503

BROWN, W. Langdon: Diabetes in relation to the ductless glands, 191. (O)—Diagnosis of nervous disorders of stomach and intestine, 504—Principles of internal secretion, 687. (O)

BROWN, William: Psychotherapy, 625—Psychopathology and dissociation, 847. (O)—Hypnotism and suggestion, 951

BROWNE, F. J.: "Anencephalic syndrome in relation to apituitarism," 828

BROWNE, T. R.: State and future of medical practice, 45

BRUCE, Sir David: Tetanus in home hospitals, 486

BRUCE, Ironside: *X*-ray diagnosis of tumours of thorax, 395

BRUCE, William, death of, 676; obituary notice of, 723, 804

BRUCE-PORTER, Bruce: Blind masseurs, 804

BRÜCKNER, A. (and W. MEISNER): *Grundriss der Augenheilkunde für Studierende und praktische Aerzte*, rev., 596

BRULÉ, M. (and others): *Foie et Pancréas*, rev., 550

BRYAN, F.: Tennis elbow, 261

BUCHANAN, G. S. (and others): *Dysentery, Trench Fever, Gas Poisoning, and its Sequelae in Relation to Disabled Ex-Service Officers and Men*, 553

BUCHANAN, R. J. M.: Subacute bacterial endocarditis, 310—Diagnosis of nervous disorders of stomach and intestine, 506

BUCKLEY, J. C.: Syphilis, 979

BUCKMAN, T. E (and others): Studies on arthritis in the United States Army, 983

BUIST, H. Massac: Motor notes for medical men, 27, 82, 441, 604, 715, 760—Price of petrol on the Continent 531

BUIST, R. C.: Preliminary science in the medical curriculum, 74—Puerperal sepsis, 272

Bullinus or *Isidora*, 648

BUNGE, Gustav, death of, 981

Burdett's Hospitals and Charities, 1920, rev., 941

BURGESS, A. H.: Surgical treatment of gastric ulcer, 106—Surgical treatment of cancer of rectum, 738—Diagnosis of acute abdominal crises, 877 (O)

BURKE, E. T.: Mortality of venereal diseases, 257

BURKE, Noel H. M.: Treatment of denervated muscle, 242—Value of electrical testing of nerves at operation, 388

Burke's Peerage, pamphlet on, 994

BURKITT, R. W.: "The Right to Strike," 609

BURLEIGH H. W.: The late Dr. Leonard Guthrie, 876

BURNETT, Sir Napier: Voluntary and municipal hospitals, 638

Burr, a concave, 211

BURROUGHS, A. E., appointed specialist medical referee for ophthalmic cases, 299

BURTON, J. A. G.: Subacute bacterial endocarditis, 310

BURTON, Assistant Surgeon Robert Graves, obituary notice of, 30

BURTON-FANNING, F. W.: Bromoform poisoning, 783

BUTCHER, Flora: Venereal disease in women and children, 196, 201

BUTTAR, Charles: Municipalization of hospitals, 527, 552—Future position of *à la suite* officers in territorial hospitals, 871—Future of the Poor Law infirmary, 987—Administration of a municipal hospital, 987

BUXTON, Dudley Wilmot: *Anaesthetics: Their Uses and Administration*, rev., 669—Psychology of anaesthesia, 859

BUZZARD, Farquhar: Early symptoms in nervous disease, 696—Clinical aspects of lethargic encephalitis, 782

BYERS, Sir John William: Laparotomy for ruptured uterus, Caesarean section in placenta praevia, 202. (O)—Death of, 491—Obituary notice of, 531

C.

CADMAN, Sir John, appointed member of Advisory Council to Committee of Privy Council for Scientific and Industrial Research, 144

Cadmium poisoning and plumbism 530

Caesarean section for eclampsia, mother and child saved (G. Gilbert Genge), 976

Caesarean section in placenta praevia, laparotomy for ruptured uterus (Sir John Byers), 202. (O)

CAIRD, F. M.: Tuberculous stricture of intestine, 820

Calcium in treatment of tuberculosis, 187, 256

Calculi impacted in pelvic portion of the ureter (Frank Kidd), 160—Discussion, 162—Correspondence on, 335, 454, 492, 530, 567

Calculus, large urethral (Sidney B. Radley), 593

CALDECOTT, C.: Royal Earlswood Institution, 458

California, proposed bill to prohibit experiments on animals, 749, 794, 924

Call to the Bar, 708

CALLANDAR, Curle L.: *Arterio-venous Fistula*, rev., 324

Calomel, intolerance of (R. F. Bolt), 245

CALMETTE, A.: *L'infection bacillaire et la Tuberculose chez l'homme et chez les animaux*, rev., 894

Cambridge, meeting of the Association at, 24, 58. *See also* Association

Cambridge Bulletin, 128

Cambridge, science teaching at in the seventies 572

CAMERON, H. C.: Children in general practice, 745

CAMERON, Murdoch: Appreciation of Samuel Sloan, 723

CAMMIDGE, P. J.: Acidosis in disease, 73—(and H. A H. HOWARD): Seven cases of essential pentosuria, 777. (O)

CAMPBELL, Harry: Cancer research, 655

CAMPBELL, Robert, obituary notice of, 455—Funeral of, 491—Memorial to, 839, 915

CAMPBELL, T., called to the Bar, 845

Canada: Vital statistics of Winnipeg, 592

Canal Boats Committee appointed, 559

Cancer, two cases of, alive eight years after radium treatment (Echlin S. Molyneux), 548. (O)

Cancer of the extremities of the alimentary tract, tongue, and rectum (Sir William Macewen), 922

Cancer of Fallopian tube, primary, 165

Cancer and heredity, 296

Cancer, inoperable, treatment of by sodium dimethylarsenate, 645

Cancer and insanitary housing, 337

Cancer of jaw, inoperable, arrest of growth in (R. H. Norgate), 280

Cancer prevention and stasis (A. C. Jordan), 959 (O)

Cancer of rectum, surgical treatment of (W. Ernest Miles), 730—(G. Grey Turner), 734—(P. Lockhart-Mummery), 737—(A. H. Burgess), 738—(Charles Ryall), 739—(Herbert H. Brown), 739—(Sir C. Gordon Watson), 739—(Hamilton Drummond), 740—(R. H. Jocelyn Swan), 740—(D. P. D. Wilkie), 741—Discussion, 741

Cancer Research Fund, Imperial, annual meeting, 176

Cancer research, present position of (J. A. Murray), 653—(H. J. Campbell), 655—(J. C. Mottram), 655—(Sidney Russ), 656—(Archibald Leitch), 656—(Simon Flexner), 658—(J. G. Adami), 658

Cancer, spiroptera, in mice, 405

Cancer, treatment of, 228

Canned food. *See* Food

CANNEY, Leigh: Climate in rheumatoid arthritis, 614

CANUYT, Georges (and J. ROZIER): *L'Anesthésie Locale et Régionale en Oto-Rhino-Laryngologie*, rev., 517

Capillary poisons. *See* Poisons

CAPON, Robert M: Leaflet on cleaning the teeth, 488

Carbon tetrachloride poisoning, 497

Carcasses, exposure of (parliamentary question), 182

Carcinoma. *See* Cancer

Cardio-vascular response to adrenalin injections, 486

CARLILL, Hildred: Early symptoms in nervous disease, 696

Carlisle experiment in liquor control, 185—Financial aspects of, 838

CARMICHAEL, Major D. G.: Congenital diaphragmatic hernia, 32

Carnesco caramels, 551

CARROLL, J.: Gall stones and parsley, 338

CARR-WHITE, Colonel Percy, C.B.E. conferred upon, 260

CARTER: *Anopheles plumbeus* may become infected with the malarial parasite, 697

Cases, group of unusual, 726

CASTAIGNE, J. (and others): *Foie et Pancréas*, rev., 550

Castellani's acladiosis (R. W. Mendelson), 664

CASTLE, W. F.: Pleural reflex, 936

Casualties in Russia (parliamentary question), 137—In Mesopotamia (parliamentary question), 796

Catarrh, acute suffocative, or acute pulmonary oedema (John A. Henderson), 207. *See also* Oedema

Catarrh, chronic post-nasal, acidosis and vomiting, 567

Catarrh, defensive value of normal mucous formation, and the theory of (F. G. Crookshank), 627. (O)—Correspondence on 681

CATES, Joseph: *The Welfare of the School Child*, rev., 518

Catgut, London Hospital, 614

Catgut, sterile, 98

CATHCART, E. P. (and J. B. ORR): *Energy Expenditure of the Infantry Recruit in Training*, 521—Psychic secretion, its relation to digestion, 893

Catheters, aseptic, 875

Cats and diphtheria, 406

CAUTLEY, Edmund: Tuberculous milk, 643

CAWSTON, F. G.: Antimony in leprosy, 76, 855. (O)

Cell evolution, 767

Census Bill, 254, 760

Census (Ireland) Bill, 254

Census, the war physical (Sir James Galloway), 381 (O), 528—Correspondence on, 452, 528

Central Liquor Control Board. *See* Liquor

Central Midwives Board. *See* Board

Cereal ears as foreign bodies, 701, 806, 846

Cerebellar tumour (R. T. Williamson), 591. (O)

Cerebral surgery, glass retractors for, 941

Cerebro-spinal fever. *See* Fever

Cerebro-spinal fluid examinations (A. D. and P. M. Bigland), 786

Cerebro-spinal fluid, excess of (Hill Abram), 892

Cerebro spinal fluid and hypophyseal extracts, 288

Cerumen, 726

CHAMPNEYS, Sir Francis: Appreciation of Willoughby Furner, 769

Charenton lunatic asylum to be converted into a maternity hospital, 417

Charities Register and Digest, Annual, rev., 824

Charms, 947

Chaulmoogra oil in leprosy, 97

CHEATLE, Sir G. Lenthal: Operation for the radical cure of inguinal and femoral hernia, 68. (O)

Chemiotherapy, action of (J. E. R. McDonagh), 660. (O)

Chemist, action against at Leeds for inaccurate dispensing, 922

Chemistry, colloid, third report on, 619

Chemistry in the medical curriculum (Arthur Smithells), 19

Chemistry, review of book on, 746

Chemists and druggists, registration of (parliamentary question), 796

Chicago, deaths from anthrax in, 145

CHICK, Harriette: Vitamines in clinical medicine, 151—(and Elsie J. DALYELL): Influence of overcooking vegetables in causing scurvy among children, 546. (O)

Chicken-pox and herpes (Claude B. Ker), 126—(James Taylor) 436

Child welfare, review of books on, 246. *See also* Maternity

Childbirth, painless. *See* Labour

Childhood, the Mind of, rev., 323

Children in general practice (H. C. Cameron), 745

Children, physically defective, case of, joint conference on, 837

Children and the slums in Australia (Harvey Sutton), 492

Children's diseases, review of book on, 896

China: Medical education in Peking, 292—Mission hospitals, 292

CHISHOLM, J.: Chorion-epithelioma of ovary, 938

Chloroform, dosimetric, 494

Cholecystectomy: is it the normal operation in cholecystitis? (K. W. Monsarrat), 892

Cholecystitic heart *See* Heart

Cholera in a new country (Kedah), 418

Cholera, plague, and yellow fever (leading article (943)

Chorion-epithelioma of ovary (Miles H. Phillips, 938—(J. Chisholm), 938

CHRISTIE, William Ledingham, obituary notice of, 414

CHRISTOPHERSON, J. B.: Antimony in bilharzia, 258, 854—On the action of tartrate of antimony in intravenous injections, 854 (O), 937

CHURCHILL, Spencer: Hyperhidrosis, 876

Churns, cleansing of, 488

Cinema eyestrain, method of eliminating, 875

Circumcision, 32

Cirrhosis, fatal hepatic, in a young man (H. Brookman), 208

Cirrhosis, hepatic, of biliary origin (leading article), 555

Cirrhosis, hepatic, allied to Hanot's disease (Sir Humphry Rolleston and Stanley Wyard), 544. (O)

Civil Liabilities Department (parliamentary question), 182

Civil life, war problems in, 553

Civil practitioners and Admiralty fees. *See* Fees

CLARE, T. C.: The mobile proximal colon, 683

CLARK, A. Desborough, obituary notice of, 874

CLARKE, Astley: Early symptoms in nervous disease, 696

CLARKE, John Michell: *Neurological and Other Papers*, rev., 440

CLARKE, J. Tertius: Tropical fleas, 921

Class fees. *See* Fees

Climate in rheumatoid arthritis, 497

Clinical hospitals. *See* Hospitals

Clinical medicine. *See* Medicine

Clinical teaching units, 567

CLOUGH, P. W.: Cardio-vascular response to adrenalin injections, 486

CLOW, Alice E. Sanderson: Menstruation during school life, 511. (O)

Club, Manchester Edinburgh University, annual dinner, 680

Clujul Medical, first numbers of, 324

Coal fire, 445

Coal mines, prevention of explosions in, 446

COBBETT, Louis: Tuberculous milk, 721

Cocaine adulterated with magnesium sulphate and calcium carbonate, in Italy, 697

Cocoa, Cadbury's, 686

Codex Medicamentarius, French medical journalists protest against drugs of French origin being described under German names in the Supplement to, 123

COHEN, Elizabeth D. A., 100th birthday of, 145
COLE, Sydney W.: Acidosis in disease, 73
Colitis, muco-membranous, treatment of, 725, 772
College, Anderson, of Medicine: Information concerning, 364—Appointments, 409, 646
College, Armstrong, Newcastle-upon-Tyne: Appeal, 838
College, Epsom: Founder's day, 89—France pensionerships, 448
College, King's: Appointments, 187, 260
College, King's, London: Reorganization of Department of Hygiene, 337—Information concerning the study of medicine, 358—Lectures and demonstrations, 570. *See also* Hospital
College, Livingstone: Commemoration day, 31—Reopened as a missionary college, 993—Annual report, 993
College, North-east London Post-graduate: Information concerning, 369
College of Nursing: House in Cavendish Square presented as headquarters, 647
College, Queen Margaret: Information concerning the study of medicine, 364
College, Royal, of Physicians, of Edinburgh: Information concerning the study of medicine, 351—Jessie Macgregor prize, 260—Annual meeting, 993—Election of Fellows, 993—Election of representatives, 993
College, Royal, of Physicians, of Ireland: Fellows, 804—Information concerning the study of medicine, 353—Licentiates, 30, 804—Members, 30, 804—Reuben Harvey Memorial Prize, 844

COLLEGE, ROYAL, OF PHYSICIANS, OF LONDON:
Appointments, 226
Awards, 226
Bisset Hawkins medal awarded, 640
Comitia, 226, 724
Communications, 226, 724
Diplomas, 724
Fellows admitted, 226
Grants, 226
Information concerning the study of medicine, 349, 371
Licences, 226, 724
Members admitted, 226, 724
Psychological medicine, 371
Removal of name, 226
Reports, 226

College, Royal, of Surgeons of Edinburgh: Admission of Fellows, 188, 684, 993—Information concerning the study of medicine, 351—Sir John Struthers lecture on antenatal death (Arthur Robinson), 985

COLLEGE, ROYAL, OF SURGEONS OF ENGLAND:
Académie de Médecine centenary, 956
Annual meeting, 684
Annual meeting of Fellows and Members, 844
Annual report, 646
Appointments, 646, 956
Board of Examiners, 226
Calendar, 724
Council election, 65
Council meeting, 646, 804
Council report, 724
Court of Examiners, 804, 956
Degrees and pass lists, 955
Dental examiners, 96
Diplomas, 226, 646, 804, 956
Election of President and Vice-Presidents, 96
Election of professors and lecturers, 96
Fellowships, 804, 956
Final fellowship examination, an additional, 867
Honorary Fellows, 25, 90
Information concerning the study of medicine, 349
Lister Memorial Fund, 226
Museum, bequests to, 25
OWEN, Sir Richard, bust of, 956
Special primary examination for Fellowship, 96, 226
Specimens, exhibition of, 640

College, Royal, of Surgeons in Ireland: Correspondence on, 141—Information concerning the study of medicine, 353
College, St. Mungo's: Information concerning the study of medicine, 364
College of Surgeons of America: Presentation of mace to by the consulting surgeons of the British armies, 597—Leading article on, 599
College, Trinity, Dublin: Degrees and Pass lists, 144—Information concerning the study of medicine, 351, 365. *See also* University of Dublin
College, University, Cork: Information concerning the study of medicine, 365
College, University, Dundee. *See* University of St. Andrews
College, University, Galway: Information concerning the study of medicine, 366
College, University, London: Proposed Institute of Anatomy (G. Elliot Smith), 67—Information concerning the study of medicine, 358—Lectures, 532. *See also* Hospital
College, University, of South Wales and Monmouthshire: Information concerning the study of medicine, 360. *See also* University of Wales
College, West London, Post-graduate: Information concerning, 369
Colleges of Medicine and Science, Newcastle-upon-Tyne: An appeal, 838
Colleges, Royal of Physicians and Surgeons of Edinburgh: Information concerning the Medical School, 363
COLLIER, James: Early symptoms of nervous disease, 693
COLLIER, Robert J., obituary notice of, 570
COLLIER, William: The hospital problem, 766, 871
COLLINS, Sir W. J.: Appreciation of James Herbert Rhodes, 297
COLLIS, Edgar (editor): *The Industrial Clinic: a Handbook dealing with Health in Work*, rev., 128—Industrial hygiene, 212
Colloid chemistry, third report on, 619
Colloidal preparations (R. W. MacKenna), 745
Colloids, review of books on, 209
Colon, malignant disease of (Sir Berkeley Moynihan), 890—Discussion, 891
Colon, mobile proximal, clinical manifestations of (John Morley), 542 (O), 644—Correspondence on, 609, 644, 683
Colonial medical service (parliamentary question), 92, 254, 290—Report, 254, 290—Report of departmental committee, 448—Letter from Colonial Office, 449—Correspondence on, 530
Colonial Office, appointments under, 378
Colonies: Committee appointed to secure assistance in carrying out research work essential to protection of inhabitants from disease, etc., 832
Colotomy, treatment after, 417
Colporrhaphy for genital prolapse (F. Hamilton Lacey), 821. *See also* Uterus, prolapse of
COLVILLE, H. C.: The Wasserman nreaction, 841
Compresses in the bladder, forgotten, 487
COMRIE, John D.: *Synoptic Chart of Cardiac Examination*, rev., 862
Concurrent treatment and training (parliamentary question), 913. *See also* Pensions Ministry *and* Ex-service men
Condenser tests in nerve injuries. *See* Nerve
Conference of Assistant Surgeons (India), 871
Congress against alcoholism, Washington, D.C., 571, 922—Attended by Sir Auckland Geddes, 922
Congress of the Association Française d'Urologie, 380
Congress, Australasian Medical, 763, 914
Congress of Comparative Pathology, International, Rome (1921), 227, 287, 685
Congress of Esperanto, International, Hague meeting, 299—Republication of *La Kuraciste*, 299
Congress of Far Eastern Association of Tropical Medicine, Batavia (1921), 647
Congress of Hydrology, Climatology, and Physical Therapy, Italian, 145
Congress of Internal Medicine, Strasbourg (1921), 570
Congress of Italian Medical Society, 725
Congress of Italian Paediatric Society, 957
Congress of Italian Society of Internal Medicine, 592
Congress of the Italian Society of Obstetrics and Gynaecology, 647
Congress, Latin-American Odontological, 208
Congress of Medical Radiology, Italian, 97
Congress, Medical, of South Africa, Durban (1920), 790—President's address, 790—Speech by Dr. Macdonald, 790—Sections, 790—Banquet, 790
Congress of Medicine and Natural Science, Flemish, 337
Congress of Military Medicine and Pharmacy, International, Brussels (1921), 724
Congress, Oxford Ophthalmological: Annual meeting, 164—Perimetric methods (Luther C. Peter), 164—Doyne Memorial Lecture: Nerve paths and centres concerned with sight (F. Richardson Cross), 165—Papers, 165—Scientific museum, 165—General meeting, 165—Dinner, 165
Congress of Paediatrics, Italian, 416
Congress of Physical Therapy, 337
Congress of the Royal Institute of Public Health (1921), 826
Congress of Royal Sanitary Institute, 212. *See also* Royal
Congress of Surgery, French (1921), 771
Congress of Universities, next meeting (1921), 794
Conjoint Board in England: Degrees and pass lists, 226, 804—Information concerning the study of medicine, 348, 370—Tropical medicine, 370
Conjoint Board in Ireland: Degrees and pass lists, 227, 956—Information concerning the study of medicine, 353
Conjoint Board in Scotland: Degrees and pass lists, 227, 612, 646—Information concerning the study of medicine, 350
CONNAUGHT, Duke of, F.R.C.S., 25
CONOLLY, Major Paul, obituary notice of, 956
CONRAN, Philip: Meat diet in sprue, 206. (O)
Constant volumes, pipette for automatic measurement of, 480
Consultative Council's report, 645—Correspondence on, 768, 803, 842—Appointments, 911
Consultative Council, Scottish, 870, 900
Consultants, future of, 64
Consumption. *See* Tuberculosis
Consumptives, industrial homes for (leading article), 600
CONTRACTOR, Captain K. H., obituary notice of, 770, 956
COOKE, Arthur (and J. W. MCNEE) Demonstration on blood transfusion, 111
Cooke's School of Anatomy, information concerning, 359
COOMBS, Carey: Subacute bacterial endocarditis, 306—Disappearance of radial pulses during deep inspiration, 958—Patent ductus arteriosus, 979
COPE, Zachary: Subacute perinephric abscess of non-renal origin, 509. (O)
Copeland *v.* Orr, 188
COPEMAN, S. Monckton: Vitamines in clinical medicine, 159
Copenhagen, Finsen Institute in, 559
COPLAND, James Alane: Results of peripheral nerve injuries treated by operation, 468
Cord, prolapse of, 338
Corner Stone of Reconstruction, rev., 168
Coroners of boroughs, remuneration of (parliamentary question), 913
Coroners' inquests, fees for. *See* Fees
Coroners' inquests (parliamentary question), 949
Coroners' salaries, London County Council to promote legislation for a fixed salary, 922
Corrections, 98, 146, 190, 228, 262, 686, 924

Correspondence:
Advertisements of practices, 258
Alcohol toxicity, influence of dilution on, 722
Allbutt, Sir Clifford, portrait of, 141
American graduates in Europe, London's opportunity, 492
Anaesthesia in tonsil and adenoid operations, 413, 455
Angina pectoris, surgical treatment of, 840, 991
Antimony: In bilharzia, 256—In kala-azar 453, 610
Antimony, intravenous injection of, 645
Army Council constitution, 333, 411
Army medical services in the war, 29
Asepsis in midwifery, 991
Blackwater fever, 802, 873
Blind alley, 29, 64, 259
Blind masseurs, 768, 804
Bonesetters *versus* the science and art of surgery, 222 256
Cadmium poisoning and plumbism, 530
Calculi impacted in pelvic portion of ureter, 335, 454, 492, 530, 567
Calcium in treatment of tuberculosis, 187, 256
Can one work with intracapsular fracture of the femur? *See* Fracture
Cancer and heredity, 296
Cancer, inoperable, treatment of, 645
Carlisle experiment in liquor control, 185
Catarrh, chronic post-nasal, acidosis and vomiting, 567
Cell evolution, 767
Clinical teaching units, 567
Colon, mobile proximal, 609, 644, 682
Colonial Medical Service, 530
Consultative Council's report, 645, 768, 803
Coroners' inquests, 454
Death certificates and coroners' courts, 412
Death after tonsillectomy. *See* Tonsillectomy
Deficiency diseases, causation in, 294
Denervated muscle, treatment of, 294
Dental Board, 803
Diseases, nomenclature of, 843
Dosimetric chloroform, 494
Emetine in bilharziasis, 645, 681
Encephalitis lethargica, problems of, 916
Endocarditis, subacute infective, 920
Eye and mouth in sleep, 529, 611
Fat-soluble content of oils, 919
Fleas, tropical, 921
Fracture of femur, intracapsular, 413, 455
Fractures, better treatment of, 139, 292, 411, 453
Future of consultants, 64
Future position of "a la suite" officers in territorial hospitals, 800, 871
Future provision of medical services, 29, 140
Gall stones and infusions, 293, 414
Germany, scientific relations with, 529
Gloucestershire scheme for extension of medical services, 916, 952
Gonorrhoea in women, treatment of, 295, 413, 454
Gonorrhoeal mastitis, 843
Government subsidies and the national health, 682
Health centres, primary, 842
Hearing, theories of, 919
Heart, dilatation of, 223, 294
Homes for treatment of incipient insanity, 918
Horse serum, normal, therapeutics of, 952
Hospital problem, solution of, 681, 719, 766, 871
Hospitals, future of, 873
Hospitals, municipalization of, 643, 766
Humerus dislocated by muscular action, 224
Hypnotism and suggestion, 918, 951
Indian Medical Service, 608, 842
Influenza, prophylactic vaccination against, 646

Correspondence (*continued*):
Inoperable cancer, treatment of, 645
Intravenous peptone therapy. *See* Peptone
Kala-azar in Mesopotamia, 335
Liberty and economy, 872
Lupus and syphilis, 224
Malignant malaria contracted in Britain, 871
Meat juice in sprue, 293
Medical Directory (1921), 64
Medical education, 295
Medical police fees. *See* Police
Medical resettlement, 259, 296
Medical services, future provision of, 29, 93, 186—*A Successful Cottage Hospital*, 93
Medical services in India, 608, 842
Mental disorder, incipient, treatment of, 410, 722
Meningococcus carriers, 493
Menstruation during school life, 568
Metric system, 953
Milk, dried, directions for using, 335, 412
Milk, tuberculous, 610, 643, 682, 721
Miner's nystagmus, 917
Mobile proximal colon, 609, 644, 682
Mucus, function of, 681
Municipalization of hospitals. *See* Hospitals
Muscle re-education in infantile paralysis, 682, 768, 841, 918, 953
National Hospital for Paralysed and Epileptic, 531
Naval Medical Service as a career, 917, 953, 991
Nervous disease, early symptoms of, 800
Nervous and functional dyspepsias, 610
Nitrous oxide gas, self-administration of, 769, 921
Nomenclature of diseases, 843
Nystagmus, 952
Orthopaedic surgeons, supply of, 843
Orthopaedic surgery, status of, 921
Oto-laryngology, specialists in, 769
Peptone therapy, intravenous, in epilepsy, 840, 871
Petrol, price of, on the Continent, 494, 531
Pleural reflex syncope, 224, 255, 333, 455
Plight of South Russian doctors, 258
Police surgeons' fees, 413, 494
Post-nasal catarrh. *See* Catarrh
Professional secrecy, 141
Psychological analysis, 410
Public health salaries, 94, 142, 224
Puerperal sepsis, 412, 452, 493, 530, 802
"Right to strike," 609
Royal College of Surgeons in Ireland, 141
Scientific relations with Germany, 529
Telephone charges, the proposed, 225
Tonsil and adenoid operations in outdoor clinics, risks after, 951, 990
Tonsillectomy, death after, 569, 611, 645, 721
Tropical fleas, 954
Tuberculosis campaign, 295
Tuberculosis in Germany, 920
Tuberculous milk, 610, 643, 682, 721, 766, 801, 872
Unified medical service, 801
Urticaria after specific fevers, 492
Vaccinal condition of small-pox carriers, 28, 95, 186, 258, 336
Vagus inhibition, 530
Venereal disease prophylaxis, 873, 920
Venereal diseases, mortality of, 187, 223, 257, 294, 334, 454, 493, 529, 568, 611
Venereal diseases among seamen, 840
Vision, theory of, 766
Vitamines, 222, 951—In margarines, 951
War physical census, 452, 528
Wassermann reaction, 224, 721, 841
Water rates in dispensing practices, 842

Cost of living. *See* Living
Cottage hospital. *See* Hospital
COTTON: Intestinal pathology of the psychoses, 132
COTTON, Thomas F.: Subacute infective endocarditis, 851. (O)
COUNCELL, R. Watson: Ergot and iron mixtures, 498
Council, General Medical: Information concerning the study of medicine, 341—And *Medical Register*, addresses for, 867

COUNCIL, LONDON COUNTY:
Asylum and hospital accommodation, 255
Coroner's salaries, legislation to pay a fixed salary, 922
Health administration in London (leading article), 285
London mental hospitals and the Ministry of Health Bill, 764—Study leave for medical officers, 845
Lying-in homes: Proposed new regulations, 221
Married women doctors, employment of, 205
Massage establishments, 799, 956
Mental hospitals: Medical officers of to be granted leave for study in mental disease, 845
Stammering children, education of, 133
The Council and the Tuberculosis Bill, 838
Tuberculosis services, 254

Cow, Douglas: *Pharmacology*, rev., 480
COWAN, John M.: Subacute bacterial endocarditis, 310
COWAN, Mary Logan, elected to a Beit Fellowship, 942
COWARD, Katherine Hope, elected to a Beit Fellowship, 942
COWELL, E. M.: New surgical needle, 481
CRAIK, Robert: Monilial gastritis, 125—Meat diet in sprue, 293
CRAWSHAW, Samuel: Encephalitis lethargica treated by hexamine, 628 (O)
CRICHTON-BROWNE, Sir James: Mortality of venereal diseases, 223, 334
Crimes of violence, 747, 910
Criminal Law Amendment Bills (parliamentary questions), 64, 182, 219, 759, 949
Criminal law and venereal disease: Report of Committee, 908
Crippled children, organized treatment of (G. R. Girdlestone), 208
CRISTIANI: Thyroid grafting, 248
CROOK, Arthur: Pregnancy after ligature of Fallopian tubes, 244
CROOKSHANK, F. G.: Calcium in treatment of tuberculosis, 256 — Mortality of venereal diseases, 611 — Defensive value of normal mucus formation and the theory of catarrh, 627. (O) — Problems of "encephalitis lethargica," 916
CROSS, F. Richardson: Doyne Memorial Lecture on nerve paths and centres concerned with sight, 165—His portrait presented to Bristol University, 642
CROSSMAN, Frank W.: Obstetrical rarities, 772
CROWE, H. Warren: Treatment of rheumatoid arthritis by vaccines, 815. (O)
CRUCHET, René (and René MOULINIER): *Air Sickness, its Nature and Treatment*, rev., 401
Cruelty to Animals Act, whole-time inspector to be appointed, 685
CULLEN, Brigade-Surgeon Lieut.-Col. Peter, obituary notice of, 414
Culture and the practice of medicine (leading article), 215
CUENCA, J. Bonorino: *El Tratamiento del Carbunculo Humano Con el Suero Normal de Bovino*, rev., 865
CUMBERBATCH, E. P.: Treatment of denervated muscle, 240
CUMMING: Cleansing of churns, 488
CUMMING, H. Lovett: Ulcerating granuloma of the pudendi cured by intramuscular injections of antimony tartrate, 775. (O)
CUMMINS, Colonel S. L.: Treatment of human trypanosomiasis and kala-azar by intravenous injections of acetyl-p-aminophenyl stibiate of sodium, 236
Cunningham's Practical Anatomy, seventh edition, rev., 479
CYRIAX, Edgar F.: Muscle re-education in infantile paralysis, 682, 919
Cyst, dermoid, rupture of vein of: intraperitoneal haemorrhage: operation: recovery (J. O. Beven), 243 (O)
Cystotomy, permanent treatment of patient with, 771

D.

Dacryocystostomy, intranasal (H. Lawson Whale), 701. (O)
Dairying, a scheme to improve, 772
Dairy research, 639
DALE, H. H.: Acidosis in disease, 72—Quinine in pharmacology and therapeutics, 121—Capillary poisons, shock and anaphylaxis, 791
DALEY, Allen, appointed M.O.H. for Blackburn, 31—Presentation to, 31
DALSACE, Jacques: *Étude Critique de l'Étiologie des Bronchites Chroniques avec Sclérose Pulmonaire*, rev., 669
DALYELL, Elsie J.: Vitamines in clinical medicine, 152—(and Harriette CHICK): Influence of overcooking vegetables in causing scurvy among children, 546. (O)
Dances, drill, and games for children, 711
Dangerous Drugs Bill, 181, 219, 379, 913—It becomes an Act, 913—Regulations, 913—Edinburgh Anti-opium Committee on, 184—Drugs which come under the prohibition, 379
DARWIN, Sir Francis: *Springtime and Other Essays*, rev., 746
DAVIDSON, W. Cameron: Acute oedema of lungs, 163
DAVIES, Morgan, obituary notice of, 416
DAVIES, Sidney: Vaccinal condition of small-pox carriers—infantile vaccination, 336
DAVIS, C. Henry: *Painless Childbirth*, rev., 668
DAVIS, Edward P.: *Manual of Obstetrics*, rev., 282
DAVIS, John Staige: *Plastic Surgery: Its Principles and Practice*, rev., 861
DAVIS, John Thomas Horron *v.* Lady Rolleston of Glen Parva Grange, Leicester, 30
DAVISON, W. H.: Public health salaries, 94, 225
DAVY, A. Humphrey: Prolapse of cord, 338
DAVY, Richard, obituary notice of, 611
DAWSON OF PENN, Lord: Diagnosis of nervous disorders of stomach and intestine, 508—Address on the Report of the Consultative Council on Medical and Allied Services: The Future of Medical Practice, 750
Deaf, electrical aids for, 897
DEANE, Colonel, resignation of, 643
DEANESLY, Edward: Chronic abdominal pain 312. (O)
Death, antenatal (Arthur Robinson), 985
Death under anaesthesia. *See* Anaesthesia.
Death from two uncommon causes (potassium chlorate tablets and stem of hemlock used as a pea-shooter), 231
Death, causes of, international conference on, 601
Death certificates and coroners' courts, 412
Death after tonsillectomy. *See* Tonsillectomy
Deaths uncertified: inquests (parliamentary question), 949
DEBOVE, G. M., obituary notice of, 955, 993
Decimal Association continues its propaganda, 31
Decimal point, inventor of, 497
Defaecation, posture in, 300, 418, 498, 846, 923
Deficiency, dietetic. *See* Dietetic
Deficiency diseases, causation in, 147 *et seq.*—Correspondence on, 294. *See also* Vitamines
Degrees for practitioners, information concerning, 367
DE LAROQUETTE, F. M.: *Atlas for Electrodiagnosis and Therapeutics*, rev., 668
DE LISLE, Frederick Irving, obituary notice of, 416
Delivery of child and placenta in unruptured membranes at term, 630, 846. *See also* Labour *and* Foetus
DELMAS reports a case of woman who after three abortions was treated with neo-salvarsan and gave birth to a healthy infant, 244
De la Rue and Co.'s medical service scheme, 331
Dementia praecox and its relation to other disorders (Bernard Hart), 470—Discussion on, 473
Dementia praecox, pathology of (Sir Frederick Mott), 781
Demodex, review of book on, 400
DEMPSEY, Sir Alexander, death of, 144—Obituary notice of, 188
DENCH, Edward Bradford: *Diseases of the Ear: a Textbook for Practitioners and Students of Medicine*, rev., 209
Denervated muscle. *See* Muscle
Dental Board, 803. *See also* Dentists Bill
Dental disease and the endocrine glands, 867
Dental sepsis causing optic neuritis (H. W. Archer-Hall), 399
Dental surgery, information concerning the study of, 378
Dental trouble and diseased tonsils and adenoids, 957
Dentists Bill, 220, 674, 677, 714, 803, 913, 949, 986—Correspondence on, 803
Dentures for ex-service men (parliamentary question), 219
DEPAGE, A., Hon. F.R.C.S. conferred upon, 90
Depilatories, 228, 300, 418
Deputy Commissioner of Medical Services. *See* Medical
Dermatology courses at Hôpital St. Louis, 337
Dermatology, review of books on, 246
Dermoid cyst. *See* Cyst
DES VŒUX, H. A.: Blepsopathia or eye-strain, 938
DEVINE, H.: Dementia praecox, 475—Psychotherapy, 625—Early symptoms in nervous diseases, 696
Diabetes in relation to the ductless glands (W. Langdon Brown), 191. (O)
Diabetes and glycosuria, prognosis and treatment of (Arthur Hall), 785—Discussion, 786
Diastase content of urine in toxaemias of pregnancy (R. L. Mackenzie Wallace), 273. (O)
DICK, Sir James Nicholas, obituary notice of, 144
DICKEY, A. A. G., presentation to, 845
DICKSON, W. E. Carnegie: Paths of infection in cerebro-spinal fever, 430
Dictionaries (medical) for reference, 771
Diet in Poor Law institutions, 712
Dietary deficiencies: Effect of on the adrenals, 867
Dietetic deficiency and endocrine activity, with special reference to deficiency oedemas (Lt.-Col. Robert McCarrison), 236—Discussion, 238
Digestion: Relation of psychic secretion to (E. P. Cathcart), 893
Diphtheria in London, 757
Diphtheria carrier of unusual type (John Allen and D. R. Wood), 818. (O)
Diphtheria and cats, 406
Diphtheria, umbilical; in the new-born, 911
Diplococcus crassus and meningitis (J. Graham Forbes), 430
Directory, a classified, 330
Disabled men's outlook (parliamentary question), 137
Disablement pensions. *See* Pensions
Disablement, total, definition of (parliamentary question), 92
Disclaimer, 958
Disease, chronic non-infectious, treated by modern methods (F. J. Sadler), 666
Disease and injury, relations of (A. McKendrick), 203. (O)
Diseases, nomenclature of, 843, 865. *See also* Nomenclature
Dispatches, Waziristan, report from Commander-in-Chief in India, 956—Names mentioned, 956
Dispensing, 876

Dispensing practices, water rates in, 842
Dissociation and psychopathology (William Brown), 847. (O)—Correspondence on, 918. *See also* Hypnotism
Divisional medical officers' (parliamentary question), 796
DIXON, Montague: Group of unusual cases, 726
DIXON, W. E.: Quinine and its related alkaloids in pharmacology and therapeutics, 113—Action of adrenalin on the bronchioles, 242
DOBSON, Margaret: Diseases and injuries of the eye, 979
Doctors of Petrograd, plight of, 259; of South Russia, plight of, 258
DOLAMORE, W. H.: The Dental Board, 803
Domestic practice, prevention in (leading article), 709
DON, Surgeon-General William Gerard, obituary notice of, 259
DONALD, Archibald: *Introduction to Midwifery*, rev., 595
DONCASTER, L.: *An Introduction to the Study of Cytology*, rev., 745
DONOVAN, Major-General William: A unified medical service, 801
DORAISAMY, Captain Subramania, obituary notice of, 414
Dosimetric chloroform. *See* Chloroform
DOUTHWAITE, Constance M.: *Baillière's Nurses' Complete Medical Dictionary*, rev., 441
Drainage treatment of ascites (Sir John O'Conor), 857. (O)
DRAPER (and others): Intestinal pathology of the psychoses, 132
DREYER, Georges (and George Fulford HANSON): *Assessment of Physical Fitness by Correlation of Vital Capacity and Certain Measurements of the Body*, rev., 323
DRINKWATER, H.: Gift to the Welsh National Museum, 409
DRINKWATER, Katharine R., appointed J.P. for county of Denbigh, 875
Drugs and dressings in India (parliamentary question), 291
Drugs causing acute ulcerative stomatitis (Hubert C. Bristowe), 399—Correspondence on, 498
Drugs, dangerous. *See* Dangerous
Drugs in Germany, great rise in the price of, 497
DRUMMOND, Hamilton: Surgical treatment of cancer of rectum, 740
DRUMMOND, J. C.: Vitamines in clinical medicine, 160
Drunkenness, habitual, and the public health authority, 458
Dublin doctors and the Health Council report, 491
Dublin public health offices, commandeering of, 990
DUCKWORTH, W. L. H., presentation to, 299
Ductless glands. *See* Glands
Ductus arteriosus, patency of (Carey Coombs), 979
DUGGAN, Norman: Volvulus of the small intestine following ileo-colostomy, 889. (O)
DUKES, Clement: Gall stones and infusions, 293
DUNCANSON, J. Gray: Rats and plague, 66
DUNDAS, J. (and W. H. F. OXLEY): Case of gonorrhoeal mastitis, 744
Dunlop Book: the Motorist's Guide, Counsellor, and Friend, rev., 897
DUNLOP, Knight: *Personal Beauty and Racial Betterment*, rev., 788
DUNN: Encephalitis lethargica, 830
DUNN, Naughton: Results of peripheral nerve injuries treated by operation, 469
DUNNETT, Agnes: Venereal disease in women and children, 201
DUNTON, William Rush: *Reconstruction Therapy*, rev., 282
Duodenal tube, review of book on, 704
Duodenum, traumatic obstruction of: operation: recovery (F. J. Strachan), 592
DURAND: Lethargic encephalitis, 829
Dutch medical calendar, 958
Dutch Society for Combating Lupus, report, 336
DUVAL, Pierre, Hon. F.R.C.S. conferred upon, 90
DUVERGER, Dr.: *L'Anaesthésie locale en ophthalmologie*, rev., 518
Dysentery, immediate surgical complications of (Basil Hughes and H. Stanley Banks), 934. (O)
Dysidrosis, 957
Dysostosis cleido-cranialis (Murk Jansen), 320
Dyspepsias, nervous and functional, 610. *See also* Nervous disorders

E.

EALAND, C. A. (editor), *Athena*, rev., 634
EAMES, Surgeon Rear-Admiral W.: Dislocation of humerus by muscular action, 224
Ear diseases, review of books on, 209
Ear, nose, and throat, instruction at the St. Joseph Hospital, Paris, 647
Earache due to larvae in the external auditory meatus (Reginald Alderson), 319
EATON, Irene C. Davy, obituary notice of, 298
ECCLES, W. McAdam: "Included foetus," 497
Economy and liberty. *See* Liberty
Eclampsia, Caesarean section for, mother and child saved (G. Gilbert Genge), 976
Eclampsia, high blood pressure in (Major C. A. F. Hingston), 977
Eclampsia and the pre-eclamptic state, etiology of (James Young and D. A. Miller), 976
EDEN, Thomas Watts: *Manual of Midwifery*, rev., 595
EDGE, B. G.: Value of legumes in beri-beri, 66
EDGE, Frederick: Puerperal sepsis, 273
EDGECOMBE, W.: Disappearance of the radial pulses during deep inspiration, 890
EDGEWORTH, F. H.: Intravenous protein therapy in epilepsy, 780. (O)—Letter on, 871

EDINBURGH:
Anti-opium Committee's resolution on the Dangerous Drugs Bill, 184
Gynaecology in, one hundred years of, 839
Health of, 915
Medical Missionary Society, 832
Royal Infirmary, 452, 643
Royal Maternity Hospital, 221
Small-pox in, 643
University appeal, 839
University Lord Rectorship, 452

EDRIDGE-GREEN, F. W., appointed special examiner in colour vision and eyesight by the Board of Trade, 134—The theory of vision, 673, 766
EDWARDS, C.: Gall stones and parsley, 498
EDWARDS, Francis H., a disclaimer, 958
Egypt: Public health in 1918, 572—Plague in 771
EINHORN, Max: *The Duodenal Tube and its Possibilities*, rev., 704
Einhorn's tube, with modifications (J. A. Ryle), 979
Electrical aids for the deaf, 897
Electrical apparatus, various catalogues of, 572
Electrical treatment of nerve injuries. *See* Nerve
Electro-therapy, review of books on, 668, 940
Elephantiasis: Rôle of *Filaria bancrofti* in production of (George C. Low and Philip Manson-Bahr), 233—Discussion, 234
ELLIOT, Lieut.-Col. Robert H.: Diagnosis of glaucoma, 108—Appreciation of Sir William Babtie, 495—*Tropical Ophthalmology*, rev., 516—The medical services in India, 608
ELLIOTT, Charles C.: Paracentesis abdominis, 686
ELLISTON, Guy, memorial to, 983
ELMSLIE, R. C.: Principles of correction of congenital talipes equino-varus, 320
ELWES, Lieut.-Col. F. F.: Antimony in kala-azar, 610
Emetine in bilharzia, superiority of sodium antimony tartrate to (A. H. Harkness), 890
Emetine in bilharziasis, 645, 681, 890
Emotionalism, morbid (Tom Williams), 222
Emotions, effects of on gastric secretions and motility in the human being (T. Izod Bennett and J. F. Venables), 662. (O)
Emphysema, subcutaneous, following free gas in peritoneum (H. G. G. Nelson), 280
Emphysema, surgical, after a blow on the neck (John W. Heekes), 936
Encephalitis lethargica: Increase of in Amsterdam, 139—Series of contributions in the *Revue de Médecine*, 829
Encephalitis lethargica, case of (J. J. Hanley), 743
Encephalitis lethargica in children (Leonard Findlay), 820
Encephalitis lethargica, clinical aspects of (E. Farquhar Buzzard), 782
Encephalitis lethargica treated by hexamine (Samuel Crawshaw), 628. (O)
Encephalitis lethargica, morbid anatomy of (J. G. Greenfield), 782
Encephalitis lethargica, problems of, 916
Encephalitis lethargica, review of books on, 705
Encyclopaedia of Religion and Ethics, medicine in, 910
Endocarditis, subacute bacterial (Sir Thomas Horder), 301—(E. Libman), 304—(F. J. Poynton), 306—(Carey Coombs), 306—(A. E. Gow), 307—(H. J. Starling), 308—(A. E. Gibson), 308—Discussion 309
Endocarditis, subacute infective (Thomas F. Cotton), 851. (O)—Correspondence on, 920
Endocrine activity and dietetic deficiency, with special reference to deficiency oedemas (Lieut.-Col. Robert McCarrison), 236—Discussion, 238
Endocrine gland diseases, diagnosis and treatment of (George R. Murray), 807. (O)
Endocrine glands and dental disease, 867
Energy, liberation of, during the interaction of hypochlorous acid and living and dead organic matter (Sir G. Sims Woodhead), 586
Engine starting, 146
England and Wales: Vital statistics, 79—Rabies in, 755—Malaria in, 811, 830, 871
English literature, revival of interest in in certain foreign countries, 128
Epidemics in London. *See* London
Epilepsy, diagnosis of (Alan McDougall), 979
Epilepsy, intravenous protein therapy in (F. H. Edgeworth), 780. (O)—Correspondence on, 840, 871
Epilepsy, sodium biborate of (John McCartney), 548. (O)
Erb medal, 844
Ergot and iron mixtures, 458, 498
Errata. *See* Corrections
Erysipelas terminating in acute thyroiditis (L. M. Weeks), 476. (O)
Erysipelas, cutaneous, treated with brilliant green (Joseph E. Adams), 779. (O)
Erysipelas, facial, 299
Esperanto Congress, 299
ESSER, S. J. D.: Emetine in bilharziasis, 645
Estimates (parliamentary), 289
Ether administration, a simple method of combining with the Vernon Harcourt inhaler (H. P. Fairlie), 438. (O)
Ether, open, without chill (Lionel James Picton), 69. (O)
Europe, Central, Anglo-American University Library for, 924
EVANS, E. Parry, appointed Regional Medical Officer to Ministry of Health, 771
EVANS, J. W.: Tetanus with general spasm cured with serum, 857
EVATT, Major-General Sir George: Army Council constitution, 411—Habitual drunkenness and the Public Health Authority, 458—Colonial Medical Service, 530
EWART, John Henry, obituary notice of, 259
Excess profits duty: Concession as to charitable gifts (parliamentary question), 136
Experiments on animals. *See* Animals
Express Dairy Company now producing grade A (certified) milk), 805
Ex-service men: In asylums (parliamentary question), 26, 796, 913, 986—Tuberculous, 31—Loss of an eye, 31—Dentures for (parliamentary question), 219—*Dysentery, Trench Fever, and Gas Poisoning in Relation to* (Buchanan, James, Price, and Soltau), 553—Receiving Poor Law relief (parliamentary question), 677—Concurrent treatment and training (parliamentary question), 834, 913—And county asylum, Prestwich, Manchester, 875—Treatment of mental cases (parliamentary question), 986
Extra Pharmacopoeia, 78
Extrauterine foetation. *See* Gestation
Eye diseases and injuries (Margaret Dobson), 979
Eye, loss of by ex-service men, 31
Eye and mouth in sleep, 529, 611
Eye-strain (H. A. Des Vœux), 938
Eye-strain and the cinema (Martin Harper), 875
Eye. *See also* Ophthalmology
EYRE, J. W.: Prophylactic vaccination against influenza, 646

F.

Factories and workshops in 1919, report of chief inspector, 605
FAIRBAIRN, J. S. (and Comyns BERKELEY and H. Russell ANDREWS): *Midwifery*, rev., 787
FAIRLIE, H. P.: Simple method of combining ether administration with the Vernon Harcourt inhaler, 438. (O)
Fallopian tubes, pregnancy after ligature of (Arthur Crook), 244—(A. Norman McArthur), 890
FAROY, G. (and others): *Foie et Pancréas*, rev., 550
FARR, E. A., elected mayor of Andover, 771
Fat-soluble content of oils, 919. *See also* Margarine *and* Vitamines
Fatigue, industrial, 909
Faucial angina, 262
FAULDER, T. Jefferson: A concave burr, 211
Federal Medical Officers' Relief Fund, 255
Federated Malay States: Malaria bureau reports, 416—Diminution of beri-beri in, 942
Federation of Medical and Allied Societies, conference on maintenance of hospitals by local authorities, 762. *See also* Societies
Feeble-minded, review of books on, 861
Fees, Admiralty, for civil practitioners, 724
Fees, anaesthetic, in the provinces, 994
Fees, certification, for sickness benefit under the Insurance Act (Ireland), 138
Fees, class, in Scottish universities, 839
Fees for coroners' inquests, 454, 726, 772, 876
Fees of county council lecturers, 66
Fees for medical witnesses at assizes, 950
Fees of police surgeons, 413, 458, 494
Fees of tuberculosis officers (parliamentary question), 986
Fellowship of Medicine and Post-Graduate Medical Association: Information concerning, 368—Annual meeting, 863—Annual report, 863
Femur, fracture of. *See* Fracture
FERNANDEZ, Z. P.: Tuberculous milk, 801
Fertility of the professional classes (leading article), 672. *See also* Birth rate
Fever, blackwater, notes on (Alexander Goodall), 697. (O)—Correspondence on, 873
Fever, blackwater, in Macedonia (J. F. Gaskell), 122. (O)—(A. Goodall), 126—Correspondence on, 802, 873

Fever, cerebro-spinal, bacteriology of (Joseph A. Arkwright), 420—(M. H. Gordon), 423—(T. G. M. Hine), 426—(C. W. Ponder), 427—(J. Alison Glover), 428—(W. E. Carnegie Dickson), 430—(J. Graham Forbes), 430—Discussion, 431
Fever, cerebro-spinal, and the *Diplococcus crassus* (J. Graham Forbes), 430
Fever, cerebro-spinal, Rocky Mountain, 485
Fever, enteric: Antityphoid inoculation in an epidemic of (A. Romanes and G. G. Johnstone), 932. (O)
Fever, enteric: In Glasgow, 409—In Upper Silesia, 845
Fever, enteric, in the British Expeditionary Force, 1914-1918 (Major-General Sir William Leishman), 870
Fever, scarlet, in London, 757
Fever, typhus: In Poland, 407, 447—In Scotland, 607—In Rotterdam, 613—In Paisley, 680—In Upper Silesia, 845
Fever, typhus, arrhénal in, 458
Fever, typhus, the micro-organism of, 557
Fever, typhus, prevention of (leading article), 285
Fever, yellow, cholera and plague (leading article on), 943
Fevers, the enteric: New conceptions regarding immunity to, 325, 402—Besredka's work on, 325, 402—Leading article on, 404
Fevers, specific, urticaria after. *See* Urticaria
FIBIGER: Spiroptera cancer in mice, 405
Fibroid, spontaneous extrusion of (G. C. Gell), 703
Fibroids of uterus, treatment of (Robert Knox), 535—(Herbert Williamson), 537—(Louisa Martindale), 538 — (Cuthbert Lockyer), 539—Discussion, 540
Fibroids of uterus, *x*-ray treatment (Herbert Williamson), 537
Fibroma of the ileo-caecal valve (John C. Jefferson), 819
Fibromyomata of uterus, intensive *x*-ray therapy of (Louisa Martindale), 538
FIDDIAN, J. V.: Cell evolution, 767
FIESSINGER, N. (and others): *Foie et Pancréas*, rev., 550
Fife Coal Company loses its appeal in a case of workmen's compensation, 922
Filaria bancrofti, rôle of in the production of elephantiasis and kindred diseases (George C. Low and Philip Manson-Bahr), 233—Discussion, 234
Filariasis in British Guiana (F. G. Rose), 937
Filariasis, problems of (J. W. W. Stephens and Warrington Yorke), 231
Finance Bill: Charitable contributions allowance (parliamentary question), 219
FINCKH, Alfred E.: The Wassermann reaction, 721
FINDLAY, Leonard: Treatment of syphilis in infancy and childhood, 197—Lethargic encephalitis in children, 820
Finland, tuberculosis campaign in, 145
Finlayson Lecture. *See* Lecture
FINNEY, Brigadier-General John: Honorary F.R.C.S. conferred upon, 90—Surgical treatment of gastric ulcer, 107
FINNY, W. E. St.L., proposed Mayor of Kingston-on-Thames, 685; elected Mayor, 771
Finsen Institute in Copenhagen, 559
FIRMAN-EDWARDS, L.: Case of lobar pneumonia accompanied by acute appendicitis, 477
FIRTH, Colonel Sir Robert: Sanitary workers and preventive medicine, 212
Fish bone in Wharton's duct (Jas. D. Mackay), 592
Fish, frozen, 910
FISHBERG, Maurice: *Pulmonary Tuberculosis*, rev., 786
FISHENDEN, Margaret White: *The Coal Fire*, 445
FISHER, Mrs. H. A. L.: The unmarried mother and her child, 876
FISHER, Welby Earle: Resuscitation in death under anaesthesia, 698. (O)
Fistula, arterio-venous (Curle L. Callandar), 324
Fits, diagnosis of (Alan McDougall), 979. *See also* Epilepsy
FLACK, Martin: Medical requirements for air navigation, 593
Fleas, tropical, 921, 954
FLETCHER, Cavendish (and Hugh MCLEAN): *The Link between the Practitioner and the Laboratory*, rev., 788
FLETCHER, Phineas, 898
FLEXNER, Simon: Preliminary scientific education in the medical curriculum, 73—Cancer research, 658
Flies and disease, 418
FLINT, H. L.: The cholecystitic heart, 819
Flying, medical problems of (leading article), 443—Medical requirements for (Martin Flack), 593. *See also* Aviation *and* Air
FOERSTER, Professor, awarded Erb medal, 844
Foetal mortality and maternal syphilis, 134
Foetus, full term, expulsion of, with unruptured membranes (James H. Gilbertson), 630—Correspondence on, 846
Foetus, "included," 497
Food, canned, 602
Food, condemned, at Newcastle-on-Tyne (parliamentary question), 291
Food control committees to be succeeded by local organizations (parliamentary statement), 64
Food Controller appoints inter-departmental committee to consider the sale of bread by weight, 885
Food inspection, review of books on, 980
Food Investigation Board and frozen fish, 910
Food poisoning at Bristol, outbreak of, 286
Food production and consumption, statistics of (leading article), 944
Foodstuffs, consumption of, in the United Kingdom (parliamentary question), 182
Foramen of Magendie, existence of, 526
FORBES, Alexander, presentation to, 799
FORBES, J. Graham: *Diplococcus crassus* and meningitis, 430
Forceps for intratracheal anaesthesia, 670
FORDYCE, William: One hundred years of gynaecology in Edinburgh, 839
Foreign bodies, cereal ears as, 701, 806, 846
Foreign body in larynx removed by an improvised method (L. N. Harding), 399
Foreign countries, information concerning conditions of practice in, 377
FORREST, Colonel John V., appointed superintendent of Royal Victoria Hospital, Belfast, 990
FORSSNER: Pregnancy and pulmonary tuberculosis, 287
FOSTER, Alfred: Diagnosis of hydatid disease of the lung, 887. (O)
FOSTER, G. L (and others): Studies on arthritis in the U.S. Army, 983
FOULKES, Lieut.-Col. Thomas Howard, obituary notice of, 874
Foundations of medicine. *See* Medicine
Four maternal great-grandparents alive, 772
FOWLER, Hope: *X*-ray diagnosis of tumours of thorax, 395
FOX, Francis William, elected to a Beit Fellowship, 942
FOX, J. Taylor: *The Care of Sane Epileptic Children* rev., 167
FOX, L. Webster: *Practical Treatise on Ophthalmology*, rev., 595
FOX, R. Fortescue: Appreciation of William Bruce, 804
Fracture of femur, intracapsular: can one work with? 413, 455
Fracture of right frontal bone (Henry Briggs), 665
Fractures, better treatment of, 139, 292, 411, 453
Fractures of great toe sesamoids, 408
Fractures, review of book on, 939

FRANCE:
- Anthropological Institute (International) founded in Paris, 630
- Assistance Publique, new chief, 993
- Charenton lunatic asylum to be converted into a maternity hospital, 417
- Congress of Surgery (1921), 771
- Dermatology and venereal diseases courses at Hôpital St. Louis, 337
- German doctors in Alsace and Lorraine, 686
- Influenza deaths in Paris in 1919, 417
- International Union against Tuberculosis, 911
- Medical journalists protest against the description under German names in the supplement to the *Codex medicamentarius* of drugs of French origin, 123
- Mother and child welfare in, 909
- Orthopaedic course, 875
- Prize for best work on orthopaedic surgery, 856
- Société d'Orthopédie, next annual meeting, 805
- *See also* Paris

FRANCIS, L. A.: Working of an *x*-ray apparatus in a small cottage hospital, 685
FRASER, Alexander G., obituary notice of, 532
FRASER, John: Treatment by tendon transplantation of paralysis involving ankle-joint, 320
FREIBURG: Fractures of great toe sesamoids, 408
FREMANTLE, Lieut.-Col. F. E.: Maternity and child welfare, 213—Parliament and public health, 677
FRIEL, A. R.: *Electric Ionization*, rev., 596
Frontal bone, fracture of (Henry Briggs), 665
Fruit juices, dried antiscorbutic, 250
FRY, Wilfred T.: Computation of income tax (1920-21), 417
FULTON, Adam: State and future of medical practice, 45
Fund, Country Children's Holiday, 65, 380
Fund Guild, Royal Medical Benevolent, 452, 756, 957—Matinée, 756, 957
Fund, Hospital Sunday, amount available for distribution, 261
Fund, King George's, for Sailors, makes an interim grant to the Merchant Seamen's Hospital, Malta, 571
Fund, King Edward's Hospital: Grant to London hospitals, 28—Emergency grant to London hospitals, 65, 227—Red Cross gifts for London hospitals, 184, 261—Statistical report on the expenditure of the London hospitals, 641—Award of grants, 947
Fund, Lister Memorial, 132
Fund, National Relief: Grant to voluntary hospitals, 331, 866—Special Distribution Committee appointed, 866
Fund, Royal Medical Benevolent, 129, 211, 451, 914
Fund, Royal Army Service Memorial, and help for cases needing convalescent treatment, 993
Funds, Auxiliary Royal Army Medical Corps, 844. *See also* Army, British
FÜRBRINGER, Max, death of, 31
FURNER, Willoughby, obituary notice of, 724, 769
Furuncle of anterior nares, treatment of, 614, 648, 686
Future position of "*à la suite*" officers in territorial hospitals. *See* Hospitals
Future provision of medical services. *See* Medical

G.

Gaitskill *v.* Thornycroft and wife, 30
GALBRAITH, S. Nicol: Tuberculous milk, 610, 722
GALLOWAY, Sir James: Venereal disease in women and children, 196—The war physical census, 381 (O), 528
Gall stones treated by infusion of parsley (H. Cameron Kidd), 244, 414—Correspondence on, 293, 338, 414, 498
Ganglia, the basal (W. K. Hunter), 631
GARBAN, H. (and others): *Foie et Pancréas*, rev., 550
Gardens, public, 846
GARDINER, Stanley: The beginnings of life, 982
GARLAND and WHITE: Left recurrent laryngeal paralysis in mitral stenosis, 946
GARROD, Sir Archibald E.: Quinine in pharmacology and therapeutics, 120—Takes up his duties as Regius Professor of Medicine at Oxford, 497
Gas fires, an intensifier for, 648
Gas, inflammable, as a product of fermentation in malignant disease of stomach (W. H. Stirling Armstrong), 477
Gas, nitrous oxide, self-administration of, 769, 921. *See also* Anaesthesia, death under
Gas poisoning, review of books on, 594
GASK, George E. (and Harold W. WILSON), *Surgery*, rev., 704
GASKELL, J. F.: Blackwater fever in Macedonia, 122. (O)
Gastric analysis, fractional method of (J. A. Ryle), 979
Gastric secretions and motility in the human being, effects of the emotions on (T. Izod Bennett and J. F. Venables), 662. (O)
Gastric ulcer. *See* Ulcer
Gastritis, monilial (Robert Craik), 125
Gateways of sense (C. S. Sherrington), 875
GEDDES, George: Puerperal sepsis, 493
GEDDES, Patrick: *Life and Works of Sir Jagadis C. Bose*, rev., 441
GELL, G. C.: Spontaneous extrusion of fibroid, 703
GEMMELL, John E.: Literature and medicine, 679
General Medical Council. *See* Council
General Nursing Council. *See* Nursing
General practitioner, future of medical practice from the standpoint of (Alfred Linnell), 38. *See also* Medical practice
General practitioner and research, 251
GENGE, G. Gilbert: Caesarean section for eclampsia, mother and child saved, 976
Genito-urinary surgery, 250, 897
German doctors in Alsace and Lorraine, 686
Germany: Production of synthetic rubber to be abandoned, 31—Number of students in the universities, 77—Great increase in the number of medical students, 170—Government allots 200,000 marks for enlargement of medical clinic at Heidelberg, 337—Institute of Psychiatric Research, 407—Great rise in the price of drugs in, 497—Scientific relations with, 529—Kaiser Wilhelm Academy to be converted into an institution for training medical men in social science, 532—Dermatological Society appoints a committee to investigate the abortive treatment of syphilis 647; next meeting of society, 719—Letter from the University of Oxford to the professors, 647—Academies of social hygiene to be established at Breslau, Charlottenburg, and Düsseldorf, 666—Erb medal awarded, 844—Deaths from tuberculosis in Prussia, 845
Gestation, extrauterine, case of, presenting in the vagina (Arthur E. Joscelyne), 516
Gestations, ectopic, two in the same patient within eight months (R. C. Harkness), 245
GHOSH, Rakhaldas: *Treatise on Materia Medica and Therapeutics, including Pharmacy, Dispensing, Pharmacology, and Administration of Drugs*, rev., 210
GIACOSA, Piero: Preliminary science in the medical curriculum, 74—The international problem of medical education, 824
GIBBS, Charles: Latent syphilis in pregnancy, 785

GIBSON, A. G.: Subacute bacterial endocarditis, 308
GIBSON, William, retires at the age of 97, 875
GILBERT: *L'Art de Prescrire*, 830
GILBERTSON, James H.: Expulsion of full-term foetus with unruptured membranes, 630
GILES, Colonel P. Broome: The Army Medical Services in the war, 29—Army Council constitution, 333
GILL, Lieut.-Col. James Geoffrey, C.B.E. conferred upon, 260
GILLIES, H. D.: *Plastic Surgery of the Face*, rev., 245
Gingivitis and lingual neuralgia, persistent, 457
Gingivitis, persistent, with chronic neuralgia of the tongue, 993
GIRDLESTONE, G. R.: Organized treatment of crippled children, 208
GIRDWOOD, D.: State and future of the medical profession, 46
GLADSTONE, H. B.: Venereal disease prophylaxis, 921
Glands, ductless, diabetes in relation to (W. Langdon Brown), 191. (O)
Glands, endocrine, and dental disease, 867
Glands, endocrine, diagnosis and treatment of some diseases of (George R. Murray), 807. (O). *See also* Endocrine
Glasgow: Clinical school opened at Victoria Infirmary, 680—Health of, 915—Small-pox in, 93, 221, 409, 452, 497, 607—(Parliamentary question), 64, 92, 136, 181, 949—Typhoid fever in, 409—Voluntary hospital principle, 950
Glass retractors for cerebral surgery, 941
Glaucoma, diagnosis of (Lieut.-Col. Robert H. Elliot), 108—Discussion on, 111
Glioma retinae, double, two cases of (A. R. Moodie), 856. (O)
Gloucestershire scheme for extension of medical services, 916, 952
GLOVER, J. Alison: The meningococcus carrier rate, its relation to prophylaxis against cerebro-spinal fever, 428
Glycosuria and diabetes, prognosis and treatment of (Arthur Hall), 785—Discussion, 786
GLYNN, Ernest E. (and J. C. MATTHEWS): Fatal case of malignant tertian malaria contracted in the North of England, 811. (O)
GOADBY, Sir Kenneth: State and the future of the medical profession, 45
GODFREY, John Thomas, charged with fraud in insurance practice, 992
Goitre, research into etiology of in New Zealand, 457
Gonorrhoea in women, treatment of, 295, 413, 454
Gonorrhoea. *See also* Venereal
Gonorrhoeal mastitis, case of (W. H. F. Oxley and J. Dundas), 744—Correspondence on, 843
GOOD, John: Medical education, 295
GOODALL, A.: Blackwater fever, 126, 697. (O)
GOODALL, Edwin: Treatment of incipient mental disorder, 410
GOODALL, E. W.: Occurrence of urticaria after specific fevers, 492
GOODALL, J. Strickland (and Lambert ROGERS): Blood pressure in Graves's disease, 588. (O)
GOODMAN, R. N.: Early symptoms of nervous disorder, 697
GOODWIN, Lieut.-General Sir John: Appreciation of Sir William Babtie, 495
GOODWIN, Surgeon-Major John Killaly, obituary notice of, 769
GORDON, J. F.: Dislocation of humerus by muscular action, 224
GORDON, M. H.: Bacteriological studies of cerebro-spinal fever among troops (1914–1918), 423
GORDON, Colonel Philip Cecil Harcourt, obituary notice of, 496
GORDON, R. G.: Diagnosis of nervous disorders of stomach and intestine, 507
GORDON, W.: Liberty and economy, 872
GORGAS, Surgeon-General William Crawford, obituary notice of, 64—Funeral service at St. Paul's, 88—Memorial to, 526
Gorgeous Poetry, 1911–1920, rev., 551
GORING, Mrs. Charles, awarded a Civil List pension, 145
GOULD, Sir Alfred Pearce: Blind masseurs, 768
GOULD, George M.: *A Pocket Medical Dictionary*, rev., 981
Government subsidies and the national health, 682
GOW, A. E.: Intravenous protein therapy in puerperal septicaemia, 268—Subacute bacterial endocarditis, 307
GOZNEY, Captain Charles Marsh, obituary notice of, 874
GRADWOHL, R. B. H. (and A. J. BLAIVAS): *The Newer Methods of Blood and Urine Chemistry*, rev., 746
GRAHAM, Edward: *Harrow Life of Henry Montague Butler, D.D.*, rev., 789
GRAHAM, E. W., obituary notice of, 298
GRAHAM, J. M.: Blood transfusion, 820
GRAHAM, Lewis: Puerperal sepsis, 271
Granuloma of pudenda, ulcerating, cured by intramuscular injections of antimony tartrate (H. Lovett Cumming), 775. (O)
GRANT, Graham: *Diary of a Police Surgeon*, rev., 210
Grass (rye) in lung removed from pleura (R. Eccles Smith), 701 (O). *See also* Foreig bodies
GRATTE, Charles Brooke, obituary notice of, 612
Graves's diseases, blood pressure in (J. Strickland Goodall and Lambert Rogers), 588. (O)
GRAY, Charles: Bacteriology of cerebro-spinal meningitis, 433
GRAY, Henry: *Anatomy, Descriptive and Applied*, 21st edition, rev., 634
GRAY, H. Tyrrell: Diagnosis of nervous disorders of stomach and intestine, 505
Great general practitioner (Francis Adams), 673
Great-grandparents, four maternal alive, 772; five alive, 806
Greek science and modern science, 550, 557
Green, brilliant. *See* Brilliant
GREEN, A. Withers: Future provision of medical services, 140—Medical police fees, 413, 458
GREEN, Robert Holmes (and Harlow BROOKS), *Diseases of the Genito-urinary Organs and the Kidney*, rev., 633
GREENFIELD, J. G.: Morbid anatomy of lethargic encephalitis, 782—Degeneration and regeneration of peripheral nerves, 783
GREENWOOD, M.: Mortality of venereal diseases, 568—Fertility of the English middle classes, 672
GRENIER, Frank: Climate of Kandy, 533
GREY, J. Temperley: Future provision of medical services, 186—Scientific medical work in South Russia, 641
GREY, Temple: Plight of South Russian doctors, 258
Griffin, Charles and Co., Centenary volume of, rev., 788
GRIFFITH, T. Wardrop: Preliminary science in the medical curriculum, 76—Subacute bacterial endocarditis, 309—Medicine at the University of Leeds, 670
GRIFFITHS, Col. Joseph: The Army Medical Service and its relation to the training of newly-qualified medical men, 965
GRIFFITHS, Joseph: Bonesetters *versus* the science and art of surgery, 256—Solution of the hospital problem, 681, 721
GRIFFITHS, Lieut.-Col. Philip Rhys, obituary notice of, 144
GRIFFITHS, William L.: Better treatment of fractures, 139
GRIMES, John, obituary notice of, 225
GROVES, Hey: Bone grafting, 320
Growth, feebleness of (Mark Jansen), 320
GUBB, Alfred S.: The metric system, 953
Guernsey, tuberculosis in, 920
Guiana, British, filariasis in (F. G. Rose), 937
GUILLAIN, Georges (and J. A. BARRÉ): *Travaux Neurologiques de Guerre*, rev., 324
Gum acacia: Sterilized solutions to be placed on the market, 66
GUNN, J. A.: Quinine in pharmacology and therapeutics, 121
Gunshot in appendix, 320, 664
GUTHRIE, Leonard, portrait of, 498, 876
GUY, Mary, obituary notice of, 874
GUYON, Jean Casmir Félix, obituary notice of, 216
Gynaecological and obstetric education (Henry Briggs), 229. (O)
Gynaecological practice, radiology in (Cuthbert Lockyer), 539
Gynaecology in Edinburgh for one hundred years, 839

H.

HACKER, H. P.: Malaria-carrying properties of the various species of anophelines, 416
Haemorrhage, accidental, pathology of (Gordon Ley), 165
HAIG, Lieut.-Col. Percy de Haga, obituary notice of, 532
HALAHAN, T. D.: Chronic neuralgia of the tongue with persistent gingivitis, 993
HALE-WHITE, Sir William: Vagus inhibition, 530—Medicine at the end of the eighteenth century, 598—*Materia Medica, Pharmacy, Pharmacology, and Therapeutics*, rev., 634
HALL, Arthur: Prognosis and treatment of glycosuria and diabetes, 785
HALL, Edmund S.: Advertisements of practices, 258
HALL, Eleanor Frances: *Florence Nightingale*, rev., 441
HALL, F., called to the Bar, 845
HALL, J. Robertson: Four maternal great-grandparents alive, 772
HALL, R. H.: Gunshot in appendix, 664
HALL-EDWARDS, J.: *X*-ray diagnosis of tumours of thorax, 395
HALLIBURTON, W. D.: *Handbook of Physiology*, rev., 247—Vitamines in margarines, 951
HAM, B. Burnett: *Handbook of Sanitary Law*, rev., 246
HAMEL, Gust.: Muscle re-education in infantile paralysis, 918
HAMILTON, Godfrey H.: National Hospital for Paralysed and Epileptic, 531
HAMILTON, J. Oliver: Meningococcus carriers, 493
HAMILTON, Captain W. R. D.: Obliterating tattoo marks, 685
Hand, sensory disturbances of, following injuries of the cerebral cortex (Henry Head and George Riddoch), 782
HANDFIELD-JONES, Charles Montague, death of, 63—Obituary notice of, 97
HANLEY, J. J.: Case of encephalitis lethargica, 743
Hanot's disease allied to hepatic cirrhosis (Sir Humphry Rolleston and Stanley Wyard), 544. (O)
HANSON, George Fulford (and Georges DREYER): *Assessment of Physical Fitness by Correlation of Vital Capacity and Certain Measurements of the Body*, rev., 323
HARDCASTLE, D. N., appointed junior neurologist to John Leigh Hospital, 31
HARDING, Esther: *Circulatory Failure of Diphtheria*, rev., 282
HARDING, L. N.: Removal of pin from larynx by an improvised method, 399
HARDY, G. H., awarded Royal Medal of Royal Society, 867
HARDY, W. B., appointed member of Advisory Council to Committee of Privy Council for Scientific and Industrial Research, 144
Harefoeah (Healing), a Jewish medical publication, 481
HARFORD, Charles F.: Future of the medical services, 94—Blackwater fever, 802—Miner's nystagmus, 917
HARKNESS, A. H.: Superiority of sodium antimony tartrate to emetine in bilharzia, 890
HARKNESS, R. C.: Two ectopic gestations in the same patient within eight months, 245—Hydatidiform mole: perforation of uterus, 744
HARPER, Martin: Method to eliminate eye-strain in the cinema, 875
HARRIS, Daniel Thomas, elected to a Beit Fellowship, 942
HARRIS, H. F.: *Pellagra*, rev., 860
HARRIS, Rutherford, obituary notice of, 456
HARRIS, Walter: Charms, 947
HARRISON, Colonel L. W.: Venereal disease in women and children, 197
Harrogate, British Spa Federation conference at, 571
HART, Bernard: Dementia praecox and its relation to other disorders, 470—Psychotherapy, 623
HARVEY, Captain W. Henwood: Pipette for automatic measurement of constant volumes, 480
HASLIP, George E.: State and future of medical practice, 33—Sir Clifford Allbutt's portrait, 141—Poor Law infirmaries and voluntary hospitals, 989
HASWELL, Lieut.-Colonel John Francis, C.I.E. conferred upon, 260
HATHAWAY, Frank: Skin apposition without superficial sutures, 280. (O)
HATHAWAY, Winifred: *Manual for Conservation of Vision Classes*, rev., 980
HAVELOCK, John G.: Tennis elbow, 190
HAWARD, Henry H.: Humerus dislocated by muscular action, 300
HAWTHORNE, Jane Lorimer: Mortality of venereal diseases, 529
HAY, John: Subacute bacterial endocarditis 309
Hay fever and paroxysmal rhinorrhoea method of treating (Morley Agar), 125. (O)
HAYNES, F. H., presentation to, 725
HAZEN, Henry H.: *Syphilis: a Treatise on Etiology, Pathology, Diagnosis, Prognosis, Prophylaxis, and Treatment*, rev., 594
HEAD, Henry (and others): *Studies in Neurology*, rev., 127—Early symptoms and signs of nervous disease and their interpretation, 691—(and George RIDDOCH): Sensory disturbances in the hand following injuries of the cerebral cortex, 782
HEAD, Joseph: *Everyday Mouth Hygiene*, rev., 247
HEAGEY: Encephalitis lethargica, 830
Health administration in London (leading article), 285
Health centres, primary, 842. *See also* Gloucestershire scheme for medical services
Health conditions in Eastern Europe (F. Norman White), 145
Health Conference, international, and venereal disease, 798
Health and the League of Nations (leading article), 405

HEALTH MINISTRY:
- Annual report of Chief Medical Officer, 675, 706, 709
- Appointments to Consultative Council, 911
- Appointments of medical officers, 986
- Blind, welfare of, report of Advisory Committee, 524—Departmental Committee set up, 526
- Canal Boats Committee appointed, 559
- Correspondence on, 682
- First year of (leading article), 130—Report by Dr. Addison on the work of, 134
- Gloucestershire scheme for the extension of medical services, 916. *See also* Medical services
- Hospital treatment for pensioners, 989
- Hospitals, provision of by county councils, 331
- House-flies and disease, 418
- Incipient mental disorder treatment, 332

HEALTH MINISTRY (*continued*):
Insanitary conditions of accommodation for staffs of theatres and music halls, 379
International Health Conference and venereal disease, 798
Irish Public Health Council, 527, 606, 678
Maternity and child welfare residential institutions, 337, 497
Meat for human consumption and slaughter of animals: committee appointed to report on, 65
Milk, use of, 713
Miscellaneous Provisions Bill, 290, 327, 331, 682, 713, 757, 795, 833, 868, 911, 947, 986—London mental hospitals and, 764—Probable abandonment of financial clauses, 795—The hospital clause, 833—Incipient mental disorder homes, 868—Voluntary hospitals, 868—Statement by Dr. Addison: Committee on finance, 869—Rejected by the Lords, 947—To be reintroduced next session, 986
Notifiable infectious diseases in 1919, 409
Parliamentary questions, 134, 290, 327, 331, 713, 757, 795, 833, 868, 986
Port sanitary administration, 255
Preventive medicine and (Sir George Newman), 635
Report on plague, cholera, and yellow fever throughout the world (leading article on), 943
Report of Scottish Consultative Council, 870, 900, 950
Scottish Board of Health, 409, 567, 900
Venereal diseases treatment centres, revised list, 416, 993
Voluntary hospitals grant in respect of duty paid spirits and drugs, 456
Work of, 134. *See also* Consultative Council

Health, the Red Cross, and the League of Nations (F. F. Roget), 639 685, 725
Health visitors, women, 648
HEANEY, F. Strong: Public health salaries, 142—Pathological dislocation of the atlas, 744
Hearing, modern theories of (G. Wilkinson), 859—Correspondence on, 919
HEARN, Ethelbert: Poisoning by small doses of aspirin, 418
Heart affections, prognosis in (W. T. Ritchie), 126
Heart, the cholecystitic (H. L. Flint), 819
Heart, dilatation of, 223, 295, 417
Heart disease, congenital, intrauterine diagnosis of (B. H. Stewart), 819
Heart disease, review of books on, 166
Heart disease, the study of (F. John Poynton), 882. (O)
Heart surgery (Sir Charles Ballance), 523
HEDLEY, J. Prescott: Puerperal sepsis, 272
HEEKES, John W.: Surgical emphysema after a blow in the neck, 936
HEHIR, Major-General Patrick: *Filaria bancrofti* and elephantiasis, 234—Dietetic deficiency and endocrine activity, 238—K.C.I.E. conferred upon, 260—Appreciation of Henry John Andrews, 769
HEISER, A. L.: Self-administration of nitrous oxide gas, 921
HELE, T. S.: Quinine in pharmacology and therapeutics, 120
HELLIER, J. B.: Osteomalacia treated by oöphorectomy, 587
HELLIWELL, Major J. P.: The teeth in the recruit, 968
Hemlock stem used as a pea-shooter, death from poisoning by, 231
HENDERSON, C. G.: *Blindness in India and Possibilities of its Diminution*, 607
HENDERSON, John A.: Acute pulmonary oedema or "acute suffocative catarrh," 207
HENDLEY, Major-General Harold, C.S.I. conferred upon, 260
HENDLEY, P. A.: Venereal disease in women and children, 201
HENDRY, James (and J. M. Munro KERR): *Notes on Midwifery*, rev., 897
HENDRY, R. A.: Latent syphilis in pregnancy, 783
HENRY, Wallace: Diagnosis of glaucoma, 111
HENSLEY, Philip John, death of, 289—Obituary notice of, 415
Hepatic cirrhosis, fatal, in a young man (H. Brookman), 208
Hepatic cirrhosis of biliary origin (leading article), 555
Hepatic cirrhosis allied to Hanot's disease (Sir Humphry Rolleston and Stanley Wyard), 544. (O)
HERBERT OF LEA, Lord, debt of medicine to, 178
HERIOT, T. H. P.: *Manufacture of Sugar from Cane and Beet*, rev., 823
HERNAMAN-JOHNSON, F.: Treatment of denervated muscle, 242—Paralysis caused by nerve injury, 391
Hernia, diaphragmatic, congenital, 32
Hernia, inguinal and femoral, operation for radical cure of (Sir G. Lenthal Cheatle), 68. (O)
Herpes and chicken-pox (Claude B. Ker), 126—(James Taylor), 436
HERRING, P. T.: Teaching of physiology, 525—The effect of pregnancy upon the size and weight of some of the organs of the body, 886. (O)
HERRINGHAM, Sir Wilmot: The State and the future of medical practice—the consultant, 36
HESS, Dr.: Vitamines in clinical medicine, 154
Heubner prize awarded 145
Hexamine in encephalitis lethargica (Samuel Crawshaw), 628. (O)
HEYCOCK, C. T., awarded Davy medal of the Royal Society, 867
HICKSON, Sydney J.: Courses of study in science for medical students, with particular reference to biology, 12
HILL, C. A.: Recent advances in pharmacology, 131
HILL, Leonard: The science of ventilation and open-air treatment, 484
HIME, Thomas Whiteside, obituary notice of, 843
HINE, T. G. M.: Summary of the results of serum treatment of 267 cases of cerebro-spinal fever, 426
HINGSTON, Major C. A. F.: High blood pressure in eclampsia, 977
Hip-joint, acute arthritis of (S. T. Irwin), 320
HIRSCH, Charles T. W.: Dosimetric chloroform, 494
HIRSCHMAN, Louis J.: *Handbook of Diseases of the Rectum*, rev., 980
HIRST, John Cook: *Manual of Obstetrics*, rev., 282
HIRST, Stanley: *Studies in Acari. No. 1, The Genus Demodex, Owen*, rev., 400
History of science, reprints of eighteenth century papers, 519
HOBHOUSE, E.: Diagnosis of nervous disorders of stomach and intestine, 507
HODDER, A. E.: Consultative Council's report, 645
HOFFMAN, Frederick L.: *An Address on the Methods and Results of National Health Insurance in Great Britain*, 444
Holding the door ajar, 686
Holland, rabies in, 145
HOLLAND, Eardley: Puerperal sepsis, 271—Latent syphilis in pregnancy, 785
HOLLIS, W. Ainslie: Chronic post-nasal catarrh, acidosis, and vomiting, 567
HOLMES, Gordon (and others): *Studies in Neurology*, rev., 127—Psychotherapy, 626—Early symptoms in nervous disease, 694
HOLMES, James Donald: Self-administration of nitrous-oxide gas, 769
Homes for treatment of incipient insanity, 918

HONOURS, 97, 143, 145, 188, 226, 227, 260, 299, 336, 414, 416, 456, 496, 497, 532, 570, 613, 646, 684, 770, 804, 874, 922
Victoria Cross, 456
Order of the Star of India: C.S.I., 260
Order of the Indian Empire: K.C.I.E., 260
C.I.E., 260
Royal Victorian Order: M.V.O., 646
Order of the British Empire: C.B.E., 260, 414, 770, 804, 874
O.B.E., 97, 188, 260, 613, 770, 874
M.B.E., 260, 414, 770
Distinguished Service Order (and bars), 260, 532
Military Cross, 188, 260, 532
Royal Naval Volunteer Reserve Officers' Decoration, 299
Territorial Decoration, 143, 226 646, 770
Foreign decorations, 143, 145, 227, 336, 414, 416, 496, 497, 570 684, 770, 874
Order of St. John of Jerusalem, 922
Promotions, 260
Mentioned in dispatches, 143, 188
Mentioned for distinguished service, 143, 260, 299, 770, 922

HOOPS, A. L.: Cholera in Kedah, 418
HOPE, E. W.: Development of the scheme for the diagnosis and treatment of venereal disease in Liverpool, 978
HOPKINS, Gowland: Future of medical practice from the point of view of medical research, 40—Acidosis in disease, 69—Present position of vitamines in clinical medicine, 147—Huxley lecture on recent advances in science in their relation to practical medicine, 862
HOPTON, Ralph: Myopia, 262
HORDER, Sir Thomas: Clinical significance and course of subacute bacterial endocarditis, 301—Treatment of subacute nephritis by kidney decapsulation, 727. (O)
Horse serum, normal, therapeutics of, 952
Horsley memorial, 757, 795
Hospital, 4th Northern General: Annual staff dinner, 805
Hospital, American, in London: Dinner to Dr. Charles H. Mayo, 62
Hospital, Bath Royal United, 799
Hospital, Bethlem, *x*-ray department at, 680
Hospital, Bradford Municipal (leading article), 753—Meeting of medical men in Bradford, 763, 799—Correspondence on, 766. *See also* Hospitals, municipalization of
Hospital, British, for Mothers and Babies, Woolwich, 613
Hospital, Charing Cross: Information concerning the study of medicine at, 354—Course in clinical pathology, 379—Annual dinner, 566
Hospital, cottage, organization of, 190
Hospital, Dreadnought, Greenwich, post-graduate study at, 369
Hospital, Edenhall, for Limbless Men, 138
Hospital, Edinburgh Royal Maternity, annual meeting, 221
Hospital, Edinburgh War, results of operations for nerve injuries at (Maud F. Forrester Brown), 467
Hospital, Glasgow Royal Samaritan, information concerning, 364
Hospital, Guy's: Information concerning the study of medicine at, 354—Scholarships, 570
Hospital, King's College: Information concerning the study of medicine at, 354—Opening of session, 565—Proposed co-operation with Camberwell Infirmary, 985
Hospital legislation (leading article), 327, 753
Hospital, Liverpool, for Children at Leasowe, treatment of tuberculosis at, 137
Hospital, London: Prizes and certificates at the Medical College, 187—Information concerning the study of medicine at, 354—Payments by patients at, 408—Scholarships, 532—Makes surgical catgut, 614—Position of (parliamentary question), 834
Hospital, Middlesex: Information concerning the study of medicine at, 355—Annual dinner, 566—Appointment to chairs, 945
Hospital, Mount Pleasant, Chepstow (parliamentary question), 92
Hospital, National, for Paralysed and Epileptic, Queen Square, London: Out-patient department still working, 189—Letter from secretary, 531
Hospital and Poor Law infirmary co-operation, 985
Hospital problem, solution of, 681, 719, 766, 871. *See also* Hospitals, voluntary
Hospital question. *See* Hospitals, voluntary
Hospital residents, unmarried, 686
Hospital, Royal Free (London School of Medicine for Women): Informal visit by Princess Mary, 65—Scholarships, 260—Information concerning the study of medicine at, 358—Luncheon at Fishmongers' Hall, 637—Fund for increasing the clinical facilities, 875
Hospital, Royal London Ophthalmic, Moorfields: Note on, 556—An appeal, 557—Gift from Sir William and Lady Lister, 685
Hospital, Royal National Orthopaedic: Mansion House appeal, 634
Hospital, Royal Victoria, Belfast: Opening of winter session, 642—Resignation of Colonel Deane, 643—Appointment of new superintendent, 990
Hospital, St. Bartholomew's: Information concerning the study of medicine at, 355—Lord Sandhurst resigns the treasurership of, 416—Annual dinner, 565—Appointments, 947
Hospital, St. George's: Contradiction of removal rumour, 189—Information concerning the study of medicine at, 356
Hospital, St. Joseph, Paris, ear, nose, and throat institution at, 647
Hospital, St. Mary's: Information concerning the study of medicine at, 357—Medical education at, 559, 567—Opening of winter session, 564
Hospital, St. Thomas's: Roll of honour, 128—Scholarships, 299, 532—Information concerning the study of medicine at, 357—Annual dinner, 565
Hospital ships in the Black Sea (parliamentary question), 137
Hospital, Sir Patrick Dun's, memorial to fallen students, 875
Hospital staffs, payment of for State-aided patients, 643—Pensions Department (parliamentary question), 913—*See also* Hospitals, voluntary
Hospital, 3rd London General (parliamentary question), 136, 291
Hospital for Throat Diseases, Golden Square, freehold property in Golders Green to be sold, 337
Hospital Trade Union, 534
Hospital treatment for pensioners, 989
Hospital, University College: Information concerning the study of medicine at, 357—Opening of winter session, 562—Goldsmid exhibitions, 570
Hospital, Westminster: Information concerning the study of medicine at, 357—Opening of winter session, 565—Old students' dinner, 613
Hospitals abroad (parliamentary question), 913
Hospitals, asylum war, history of, 410, 482
Hospitals, clinical: Information concerning, 366—Chest, 366—Children's, 366—Eye, 366—Fever, 366—General, 366—Miscellaneous special, 366—Nose, throat and ear, 366—For women, 366
Hospitals, Chinese mission, 292
Hospitals, future of. *See* Hospitals, voluntary
Hospitals, industrial (R. A. Bolam and R. Orde), 835
Hospitals, London mental, and the Ministry of Health Bill, 764—L.C.C. medical officers to be granted leave for study in mental science, 845
Hospitals of London: Red Cross gifts to, 184—Expenditure in, 641
Hospitals: Maintenance of by local authorities, 762—Conference by Federation of Medical and Allied Societies, 762

Hospitals, municipalization of: The Bradford scheme (Charles Buttar), 527, 552—Correspondence on, 643, 766—Leading article on, 753—Meeting of medical men, 763, 799
Hospitals, nationalization of (Australia), 333
Hospitals for pensioners (parliamentary question), 92
Hospitals, Poor Law (parliamentary question), 834
Hospitals, provision of, by county councils (parliamentary statement), 331
Hospitals, State control of (parliamentary question), 291
Hospitals, the State and the future of medical practice (E. W. Morris), 42. *See also* Medical practice
Hospitals, Territorial, future position of *à la suite* officers in, 800, 871
Hospitals, voluntary: Financial position of (parliamentary questions), 26, 136, 676, 713, 757, 913—Correspondence on, 681, 719, 766, 871, 873, 908—Leading articles, 327, 753—Grant from National Relief Fund, 331—Applications for grant in respect of duty-paid spirits and drugs, 456—Dr. Addison's address to the House of Commons Medical Committee, 676—The question in New Zealand, 756—Conference called by Federation of Medical and Allied Societies, 762—The question in Manchester, 763—Discussion in Scotland, 799—Conference of representatives of London hospitals, 899—Note on, 908—Discussed at Glasgow Western Infirmary, 950
Hospitals, voluntary and municipal (Sir Napier Burnett), 638—Leading article, 982—Discussion at Harveian Society, 987
Hospitals, voluntary, payment of staffs for State-aided patients, 643—Pensions Department (parliamentary question), 913
Hospitals, voluntary war, inscribed scroll presented to, 180
Hour-glass stomach (Thelwall Thomas), 892; (Thurstan Holland), 893
House-flies. *See* Flies
House rents increase (parliamentary question), 27
House-surgeons, three generations of, 924
Housing, army huts for (parliamentary question), 92—Lieut.-Col. F. E. Fremantle), 213—Common sense in site planning, 602
HOUSTON, Thomas: Behaviour of leucocytes in infection and immunity, 764
How to Conduct a Meeting. Standing Orders and Rules, rev., 788
HOWARD, H. A. H. (and P. J. CAMMIDGE): Seven cases of essential pentosuria, 777. (O)
HOWARD, J. W.: Sero-therapy of tuberculosis, 792
HOWE, Hubert S. (and Frederick TILNEY): *Epidemic Encephalitis [Encephalitis Lethargica]*, rev., 705
Huddersfield M.O.H. reports success of the principle of giving help to infants and mothers in the home, 805
HUDSON, James: Venereal disease in women and children, 201
HUGHES, Basil: Acute intestinal obstruction caused by a herniation of small intestine into the paraduodenal fossa, 515 — (and H. Stanley BANKS) Immediate surgical complications of dysentery, 934. (O)
HUGHES, Edmund: Causation in deficiency diseases, 294—Congenital syphilis, 978
HUGHES, Robert: Treatment of ringworm, 164
HUGO, D. de V.: Posture in defaecation, 923
Human metabolism (leading article), 521
HUME, D. W: Ligature of the first part of the right subclavian artery for traumatic aneurysm of the second and third parts, 243. (O)
Humerus dislocated by muscular action (F. W. Morton Palmer), 126—Correspondence on, 224, 300, 418
HUMPHRIS, F. Howard: Paralysis caused by nerve injury, 391—The melted paraffin wax bath, 397
Hunger strikers (parliamentary question), 27
HUNT, A. W. Dunning, obituary notice of, 415
HUNTER, Colonel William: Atrophy of liver, 585
HUNTER, William: Puerperal sepsis, 530
HUNTER, W. K.: The basal ganglia, 631
HURST, Arthur F.: Diagnosis of nervous disorders of stomach and intestine, 499—Psychotherapy, 623
HURST, C. H. (and A. M. MARSHALL): *Junior Course of Practical Zoology*, rev., 669
HUTCHINSON, Ernest: "The Right to Strike," 558
HUTCHISON, Robert: Vitamines, 222—(and Harry RAINY): *Clinical Methods: A Guide to the Practical Study of Medicine*, rev., 518—*Lectures on Diseases of Children*, rev., 896
Huxley lecture. *See* Lecture
Hydatid disease of the lung, diagnosis of (Alfred Foster), 887. (O)
Hydatidiform mole, perforation of uterus (R. C. Harkness), 744
Hydrochloric acid, poisoning by, recovery (Howard Stratford), 164
Hygiene, industrial (Edgar L. Collis), 212
Hygiene, Naval, Military, and Air Force, 414
Hyperidrosis, 845, 876, 957
Hypernephroma, renal, metastases in bone from a case of (E. Cronin Lowe), 786
Hypnotism and suggestion, 918, 951. *See also* Psychopathology
Hypochlorous acid, liberation of energy during the interaction of, and living and dead organic matter (Sir G. Sims Woodhead), 586
Hypophyseal extracts and cerebro-spinal fluid, 288

I.

Idiosyncrasy to novarsenobillon (Major Pierce Power), 976
Ileo-caecal valve, fibroma of (John C. Jefferson), 819
Ileo-colostomy followed by volvulus of the small intestine (Norman Duggan), 889. (O)
ILES, M.: Treatment of typhus, 458
Immunity, review of books on, 167
Imperial Medical Service (parliamentary question), 291
In Memoriam, 754
"Included foetus," 497
Income tax, 32, 66, 96, 98, 133, 145, 182, 189, 227, 261, 299, 337, 380, 417, 457, 497, 534, 571, 614, 648, 686, 726, 772, 806, 845, 876, 923, 957, 993—Of residents abroad, 92 — Parliamentary questions, 92, 182 — And post-graduate courses, 133—Definition of charity for, 182—Women doctors and, 182—Computation of income tax (1920-21), 417—Review of books on, 402, 823—Renewal of motor cars, 958
Income Tax, Doctors', rev., 824
Income Tax Guide 1920, rev., 824
Income Tax for 1920-21—Rates, Relief, Repayment, rev., 824
Income Tax and Super Tax 1842-1921, rev., 402
Index Generalis, 210

INDIA:
Assistant surgeons' conference, 871
Blindness prevention, 607
Boycott, 871
Child welfare in, 292, 870
Drugs and dressings in (parliamentary question), 291
Esher and Lovett Committee reports, 871
Infant deaths in Bengal, 765
Influenza in 1918-20 (H. G. Waters), 591 (O)
Influenza in the Central Provinces, 292
Leper problem, 871
Maternity and child welfare, 292, 870
Medical services in (leading article), 555—Correspondence on, 608, 801
Mortality in, 765
Pasteur Institute, Shillong, 608
Plague, 871
Red Cross in, 292
Tropical medicine, proposed school at Parel, Bombay, 957
Wandering lepers in Lucknow, 765

Indian Medical Service: Pensions (parliamentary questions), 26—Future of (parliamentary question), 92—Text of press communiqué issued by India Office, 142—Text of letter to British Medical Association, 142—Leading article, 555—Reports of committees (Lovett, 560; Esher, 561)—Proposed Indian Medical Corps, 560—Correspondence on, 608, 842
Indian Medical Service. *See also* Army, Indian
Indian troops of the Egyptian Expeditionary Force, incidence of worm infections in (F. H. Stewart), 592
Industrial Clinic, rev., 128
Industrial disease (parliamentary question), 913
Industrial fatigue, 909
Industrial homes for consumptives (leading article), 600
Industrial hospitals. *See* Hospitals
Inebriates, young, institution for, 725
Inebriates in Scotland (parliamentary question), 137
Infant mortality in Bengal, 765
Infantile paralysis. *See* Poliomyelitis
Infectious disease, notifiable, in 1919, report of Ministry of Health, 409
Infantile paralysis. *See* Poliomyelitis
Infirmaries, Poor Law (parliamentary question), 834
Infirmary, Camberwell, proposed co-operation with King's College Hospital, 985
Infirmary, Edinburgh Royal: Meeting of managers, 452 — Retirements and appointments, 452—Gift to, 643
Infirmary, Glasgow Victoria, clinical school opened at, 680
Infirmary, Glasgow Western, annual meeting, 950
Infirmary, Kidderminster: Memorial to Dr. S. Stretton, 957
Infirmary, Poor Law, the future of (discussion at Harveian Society), 987
Infirmary, Sheffield Royal: Grant from Red Cross Society, 719
Influenza: Deaths from in Paris in 1919, 417—Statistics of deaths from of American aborigines, 662
Influenza epidemic and the death rate (Australia), 185
Influenza epidemic in Melbourne in 1919, 951
Influenza epidemic in New South Wales, report on, 481
Influenza epidemic of 1918-19, mortality statistics, 211
Influenza in India, 1918-20 (H. G. Waters), 591. (O)
Influenza in India (Central Provinces), 292
Influenza, prophylactic vaccination against, 605, 646
INFROIT, Dr., obituary notice of, 993
Inhaler, Vernon Harcourt, simple method of combining ether administration with (H. P. Fairlie), 438. (O)
Injury and disease, relations of (A. McKendrick), 203. (O)
INMAN, Colonel Arthur William Patrick, obituary notice of, 143
Inquest fees. *See* Fees for coroners' inquests
Inquests, coroners'. *See* Coroners
Insanity, decrease of in Scotland, 138
Insanity, incipient, homes of treatment of, 918. *See also* Mental disease
Inscriptions of speech (Edward W. Scripture), 783
Inspiration, deep, disappearance of the radial pulses during (W. Edgecombe), 890—Correspondence on, 958, 994
Institute of Physics begins work, 845
Institution, Liverpool Medical:—Inaugural address by Dr. J. E. Gemmell on literature and medicine, 679—F. Strong Heaney: Pathological dislocation of the atlas, 744—R. W. MacKenna: Colloidal preparations, 745—E. Cronin Lowe: Metastases in bone from a case of renal hypernephroma, 786—A. D. and P. M. Bigland: Cerebro-spinal fluid examinations, 786—G. C. E. Simpson: Treatment of anthrax, 821—Burton Robinson: "The sun cure" in pulmonary and surgical tuberculosis as treated at Leysin, 821 — Joint meeting with Manchester Medical Society and discussion on hour-glass stomach, 892—Dr. Stallybrass: Significance of purpuric eruptions, 893—E. W. Hope: Development of the scheme for diagnosis and treatment of venereal diseases in Liverpool, 978—Edmund Hughes: Congenital syphilis, 978
Insurance for medical men, 946

INSURANCE, NATIONAL:
Act of 1920, 63
American view of (leading article), 444
Approved societies' valuation, 291
Certification fees for sickness benefits under (Ireland), 138
Charge of fraud (John Thomas Godfrey), 992
Cost of, 92
Cost of working, 181
Expenditure, 714
Insurance Commission (Scotland) report, 409
Medical certificates and unemployment benefit, 898
Medical record cards, 796
Parliamentary questions, 92, 181, 182, 291, 714, 796, 949, 986
Ramsgate practitioner acquitted of a charge to defraud, 875
Referee consultants, 181
Remuneration of practitioners in London, 949
Sanatorium benefits, 714, 949
Sickness insurance (over 70), 92
Tuberculosis: Administrative changes, 986
Unemployment benefit and medical certificates, 898

Internal infections and skin eruptions, 498
Internal secretion, principles of (W. Langdon Brown), 687. (O)
International Journal of Public Health, 179
International Society of Surgery. *See* Society
Intestinal infections, acute, laboratory diagnosis of, 215
Intestinal obstruction, acute (J. L. Joyce), 208
Intestinal obstruction, acute, caused by a herniation of small intestine into the paraduodenal fossa (Basil Hughes), 515
Intestinal pathology in the psychoses, 132
Intestinal tumour. *See* Tumour
Intestine, small, volvulus of the whole of (C. M. Billington), 549
Intestine, small, volvulus of, following ileo-colostomy (Norman Duggan), 889. (O)
Intestine and stomach, diagnosis of nervous disorders of (Arthur F. Hurst), 496—(T. Izod Bennett), 503—(Thomas R. Brown), 503—(W. Langdon Brown), 504—(H. Tyrrell Gray), 505—(R. J. M. Buchanan), 506—Discussion, 507
Intestine, tuberculous stricture of (F. M. Caird), 820
Intranasal dacryocystostomy (H. Lawson Whale), 701. (O)
Invalid Children's Aid Association and Central Committee for Care of Cripples, joint conference, 227, 837

Ireland:
Belfast: Recent riots in, 185—Royal Victoria Hospital, opening of session, 642—Elections, 990 — Tuberculosis in, 764—Chairs of gynaecology and obstetrics, 800
Byers, Sir John, death of, 491
Campbell, the late Mr. Robert, 491—Memorial to, 839, 915

Ireland (*continued*):
Central Midwives Board for Ireland, 185, 764
Dublin doctors and the Health Council report, 491
Dublin public health officers, the commandeering of, 990
Fees for medical witnesses at assizes, 950
Irish health grants, 606
Irish Public Health Council, 527, 606
Insurance Act, certification fees for sickness benefits under, 138
Public Health Council: Withdrawal of State grants for Irish health services, 527—Grants for voluntary hospitals, 527—Report of, 678
Salaries of Poor Law medical officers: Thomastown, 139; Balrothery, 139—Mullingar, 950—Gorey, 950
Ulster Medical Society, 764

Irish Medical Schools' and Graduates' Association, annual meeting, 805
Irish Public Health Council, 528, 606, 678. *See also* Public health
Iritis, causes of (Mr. Roper), 745
Iron and ergot mixtures. *See* Ergot
IRWIN, S. T.: Acute arthritis of hip-joint, 320
Is life worth living? 994
Isidora or *Bullinus*, 648
Italy: Medical practice in, 190—Society for Advancement of Science, 311—Price of medical journals to be raised, 337—Congress of Italian Society of Internal Medicine, 592—Congress of the Italian Society of Obstetrics and Gynaecology, 647—Society of Orthopaedics, 685—Cocaine extensively adulterated with magnesium sulphate and calcium carbonate in, 697—Congress of Italian Medical Society, 725—Congress of Italian Paediatric Society, 957
IVATTS, Edgar R.: Tuberculous milk, 644, 872
IVENS, Frances: Puerperal sepsis, 271

J.

JACOBSON: Cerebro-spinal fluid and hypophyseal extracts, 288
JAMES, J. Brindley, re-elected President of Society of Members of the Royal College of Surgeons of England, 725
JAMES, Lieut.-Col. S. P. (and others): *Dysentery, Trench Fever, Gas Poisoning, and its Sequelae in Relation to Disabled Ex-Service Officers and Men*, 553—*Malaria at Home and Abroad*, rev., 651
JAMESON, R. W., called to the Bar, 31
JAMIESON, Robert, appointed J.P. for county of Bute, 956
JANSEN, Murk: Feebleness of growth, 320—Dysostosis cleido-cranialis, 320
Jaundice, periodic (Cecil Williams), 979
Java, plague in, 417, 845
JAWORSKI, H.: Nomenclature of diseases, 843, 865
JEFFERSON, John C.: Fibroma of the ileo-caecal valve, 819
JENKINS, D T.: State and future of medical practice, 45
JENTZER: Coexisting primary malignant tumours, 488
JEPHCOTT, Charles: Anaesthesia in tonsil and adenoid operations, 455
JEPSON, Edward, three generations of house-surgeons, 924
JEVONS, Sophia, to stand as an independent candidate for the University of London, 526
Jewish quarterly medical journal, *Harefoeah*, 481
JOHNSTON, A. R.: Pleural reflex syncope, 455
JOHNSTON, Thomas Fair, obituary notice of, 570
JOHNSTONE, G. G. (and A. ROMANES): Value of extensive inoculation of a community during an epidemic of typhoid fever, 932. (O)
JOHNSTONE, R. J.: Puerperal sepsis, 272
JOLY, J. S: Treatment of calculi impacted in pelvic portion of ureter, 162
JONES, E. R.: Intravenous injection of antimony, 645
JONES, Frederic Wood: *The Principles of Anatomy as Seen in the Hand*, rev., 281
JONES, H. Lewis: *Medical Electricity*. rev., 940
JONES, John Kenrick, obituary notice of, 612
JONES, Sir Robert, awarded Cameron prize of University of Edinburgh, 63—Remarks on orthopaedic surgery in relation to hospital training, 773. (O)
JONNESCO: Surgical treatment of angina pectoris, 793
JORDAN, A. C.: Stasis and the prevention of cancer, 959. (O)
JOSCELYNE, Arthur E.: Case of extrauterine foetation presenting in the vagina, 516
"Journal," the, 958
Journals, early medical, 907, 958
JOYCE, J. L.: Acute intestinal obstruction, 208—End-results of peripheral nerve injuries treated by operation, 468

K.

Kaiser Wilhelm Academy to be converted into an institution for training medical men in social science, 532
Kala-azar treated by intravenous injections of acetyl-p-aminophenyl stibiate of sodium (Philip Manson-Bahr), 235—Discussion, 236
Kala-azar treated by antimony, 453, 610, 645
Kala-azar in Mesopotamia, 335
Kandy, climate of, 457, 533
KANT, Immanuel (Sir James Barr), 685
Kata thermometer, 685
Kedah, cholera in, 418
KEEN, W. W.: Address as President of International Society of Surgery, 132
KEITH, Arthur: Preliminary science in the medical curriculum: anatomy, 15
KEKEWICH, Sir George: *The Education Department and After*, 675
KELLAWAY, C. H.: Effect of certain dietary deficiencies on the adrenals, 867
KENNEDY, Lieut.-Col.: Treatment of human trypanosomiasis and kala-azar by intravenous injections of acetyl-p-aminophenyl stibiate of sodium, 236
Kent, antituberculosis campaign in, 490
KEOGH, Sir Alfred: Appreciation of Sir William Babtie, 495
KERR, Claude B.: Herpes and chicken-pox, 126—*Infectious Diseases: A Practical Textbook*, rev., 518
KERR, J. M. Munro: Surgery of uterus bicornis unicollis, 665
KERR, J. M. Munro (and James HENDRY): *Notes on Midwifery*, rev., 897
KIDD, Archibald: Vaccinal condition of small-pox carriers, 28, 186, 336
KIDD, Frank: Treatment of calculi impacted in the pelvic portion of the ureter, 160—*Common Infections of the Kidney with the Colon Bacillus and Allied Bacteria*, rev., 400
KIDD, H. Cameron: Treatment of gall stones by infusion of parsley, 244, 414
KIDD, Leonard J.: Furuncle of anterior nares, 686
Kidney decapsulation in treatment of subacute nephritis (Sir Thomas Horder), 727 (O)—Discussion on, 744
Kidney fixation by a new operation (Victor Bonney), 744
Kidney infections, review of book on, 400
King Edward's Hospital Fund. *See* Fund
KING, Helen Dean: *Studies in Inbreeding*, 522
KINGSCOTE, Ernest: Dilatation of the heart, 294—Disappearance of radial pulses during deep inspiration, 958—Treatment of angina pectoris, 991
KIRK, Robert, obituary notice of, 684
KISCH, Franz (and others): *Handbuch der klinischen Hydro-, Balneo-, und Klimatotherapie*, rev., 441
KNAPP, Arthur W.: *Cocoa and Chocolate: their History from Plantation to Consumer*, rev., 519
KNOX, Robert: *X* rays in diagnosis of tumours of thorax, 392—Treatment of uterine fibroids, 535—Need for a radiological institute, 832
KOCH, H.: Death after tonsillectomy, 569
Koch Institute for Combating Tuberculosis makes various donations, 403
KOETTLITZ: Primary tuberculosis of spleen, 408
KRAEPELIN: German Institute of Psychiatric Research, 407
KRAUS, R. (and others): *El Tratamiento del Carbunclo Humano Con et Suero Normal de Bovino*, 865
KROGH, August, awarded Nobel Prize (1920), 713

L.

Labour complicated by marked elongation of the supravaginal cervix (E. Farquhar Murray), 549
Labour: Delivery of child and placenta in unruptured membranes at term, 630, 846. *See also* Delivery *and* Foetus
Labour, painless, review of book on, 668
Labour, scopolamine-morphine narcosis in (Alexander Orlebar), 860
LACEY, F. Hamilton: After-results of colporrhaphy performed in 470 cases of genital prolapse, 821
LADELL, R. MacD.: Hypnotism and suggestion, 918
LAING, G. D.: Subacute bacterial endocarditis, 310
LAIRD, A.: Lupus and syphilis, 224
Lancashire, tuberculosis in, 870
LANCASTER, Lieut.-Col. John, obituary notice of, 143
LANE-CLAYPON, Janet, appointed J.P. for London, 144—*The Child Welfare Movement*, rev., 246
"Langham" telephone exchange, 832
LANGLEY, J. N., introduces discussion on the treatment of denervated muscle and on the "disuse" theory, 239
LANNELONGUE, monument to, 685

LAPAGE, C. Paget: *Feeble-mindedness in Children of School Age*. rev., 861
Laparotomy for ruptured uterus, Caesarean section in placenta praevia (Sir John Byers), 202. (O)
LARKIN, F. C., presentation to, 221
LARKING, Arthur E.: The Consultative Council's report, 768
Larvae in external auditory meatus causing earache (Reginald Alderson), 319
Laryngeal paralysis. *See* Paralysis
Larynx, removal of a pin from, by an improvised method (L. N. Harding), 399
LAVOISIER, Antoine Laurent: *Mémoires sur la respiration et la transpiration des animaux*, rev., 519
LAW, Dr.: *Filaria bancrofti* and elephantiasis, 234
Law and medicine. *See* Medicine
LAWRIE, W. Duncan: A blind alley, 64
LAWSON, James B., appointed J.P. for county of Bute. 956
LAZARUS-BARLOW, W. S.: Some pathological effects of exposure to the gamma rays of 5 grams of radium bromide, 664
LEACH, Albert E.: *Food Inspection and Analysis*, rev., 980
Lead Poisoning (Women and Children) Bill, 291
Lead poisoning and cadmium poisoning, 530
LEADER, H.: Directions for using dried milk, 335

Leading Articles:
American view of the National Insurance scheme, 444
Animal and plant pathology, 22
Anthrax treated with normal ox serum, 865
Artificial legs, 943
Association in 1920, 905
Beginnings of life, 982
Birth and growth of science in medicine, 636
Board of Education and a post-graduate school, 483
Bradford Municipal Hospital, 753
British and American surgeons, 599
Cambridge meeting, 58
Capillary poisons, shock, and anaphylaxis, 791
Culture and the practice of medicine, 215
Enteric fevers, recent investigations in, 404
Fertility of the professional classes, 672
Flying, medical problems of, 443
Food production and consumption, statistics of, 944
Foundations of medicine, 483
Founders of naval hygiene, 710
Health administration in London, 285
Health and the League of Nations, 405
Hepatic cirrhosis of biliary origin, 555
Hospital legislation, 327, 753, 982
Hospitals, voluntary and municipal, 982
Human metabolism, 521
Inbreeding and consanguineous marriages, effects of, 522
Industrial homes for consumptives, 600
Insurance scheme, national, American view of, 444
Intravenous peptone, 328
Medical problems of flying, 443
Medical services in India, 555
Ministry of Health, first year of, 130
Nature's teratological experiments, 828
Occupational therapy, 445
Orthopaedics, importance of, 791
Pharmacology, some recent advances in, 131
Plague, cholera and yellow fever, 943
Post-graduate specialization, 177
Preliminary scientific subjects and the curriculum, 88
Presidential address, 22
Prevention in domestic practice, 709
Profession of medicine, 339
Professional secrecy, 59
Proprietary Medicines Bill, 214
Public press and the public health, 864
Pyloric hypertrophy, congenital, 636
Scientific basis of ventilation and open-air treatment, 484
Some principles and an experiment (*re* Medical Consultative Council's Interim Report, 87
Syphilitic virus, strains of, 521
Thyroid grafting, 248
Tuberculosis, 906
Tuberculosis in Austria, 829
Typhus fever prevention, 285
University of London sites, 178
Ventilation and open-air treatment, scientific basis of, 484
Vision, theory of, 673
Voluntary and municipal hospitals, 982

League of Nations Health Organization (parliamentary question), 291, 332—Leading article on, 405—The Red Cross and, 639, 685, 725
League of Red Cross Societies. *See* Red Cross
LEAVITT, Frederick Elmer: *The Operations of Obstetrics*, rev., 595
LEBLANC, R: *Venereal Disease and its Prevention*, rev., 519
Lecture, Bradshaw: Surgery of the heart (Sir Charles Ballance), 523
Lecture, Cavendish: Postural activity of muscle, 288

Lecture, Chadwick: Health conditions in Eastern Europe (F. Norman White), 145—Health, the Red Cross and the League of Nations (F. F. Roget), 639, 685, 725
Lecture, Doyne Memorial: Nerve paths and centres concerned with sight (F. Richardson Cross), 165
Lecture, Finlayson Memorial: Enteric fevers in the British Expeditionary Force 1914–1918 (Major-General Sir William Leishman), 870
Lecture, Hunterian: Preventive medicine and the Ministry of Health (Sir George Newman), 635
Lecture, the Huxley: Recent advances in science in their relation to practical medicine—Balance in nutrition (F. Gowland Hopkins), 862—The gateways of sense (C. S. Sherrington), 875
Lecture, Sir John Struthers: Ante-natal death (Arthur Robinson), 985
Lecture, the Vicary (Sir D'Arcy Power), 751
Lectures, Herter: Capillary poisons, shock, and anaphylaxis (H. H. Dale), 791
Lectures, James Watson: Some chronic gastric disorders (A. Ernest Maylard), 831
LEDINGHAM, J. C. G.: Bacteriology of cerebro-spinal meningitis, 431
LEE, Major Joseph, obituary notice of, 456
Leeds: Action against a chemist for inaccurate dispensing, 922
Left-hand drives, 66
LEFTWICH, Ralph Winnington: *An Index of Symptoms with Diagnostic Methods*, rev., 981
Legs, artificial (leading article), 943. *See also* Artificial limbs
Legumes in beri-beri. *See* Beri-beri
LEHMANN, K. B. (and R. O. NEUMANN): *Atlas und Grundriss der Bakteriologie und Lehrbuch der Speziellen Bakteriologischen Diagnostik*. rev., 788
Leicestershire, tuberculosis in (parliamentary question), 291
LEITCH, Archibald: Cancer research, 656
Leper problem in India, 871
Lepers: Mission to, forty-fifth report, 593—Wandering in Lucknow, 765
Leprosy: Antimony in (F. G. Cawston), 76, 855. (O)—Correspondence on, 498—Chaulmoogra oil in, 97—In New South Wales, 752—In Norway, 795—In India, 872
Leprosy in Rodrigues, history of, 447
Leucocytes, behaviour of in infection and immunity (Thomas Houston), 764
LEVADITI, C. (and A. MARIE): La paralysis générale est due à un tréponème distinct de celui de la syphilis banale, 522
LEVEL, Maurice: *Crises*, rev., 747
LEVEN, G.: *L'Aerophagie*, 794
LEVY, A. G.: Pleural reflex syncope, 224, 333
LEWIN, Octavia: Cerumen, 726
LEWIS, J. Herbert: Care of physically defective children, 837
LEWIS, Thomas: *Mechanism and Graphic Registration of the Heart Beat*, rev., 166—Clinical significance and course of subacute bacterial endocarditis, 301, 309—Relation of physiology to medicine, 459 (O), 483
LEWTAS, Lieut.-Col. John, obituary notice of, 531
LEY, Gordon: Pathology of accidental haemorrhage, 165
Leysin, "sun cure" for tuberculosis at, 821
LEYTON, Helen G: Tuberculous milk, 802
Libel action against a medical officer of health (Copeland *v* Orr), 188
Liberty and economy, 872. *See also* Association, British Medical, reorganization of work of
LIBMAN, E.: Subacute bacterial endocarditis, 304—Diagnosis of nervous disorders of stomach and intestine, 507
Library, Anglo-American University, for Central Europe, 924
Lice as disease carriers, 923
Life, the beginnings of (leading article), 982
Light filters for the microscope, 79
LILLIE, F. R. (and C. R. MOORE): *Laboratory Outline of Embryology with Special Reference to the Chick and the Pig*, rev., 324
Limbless men, Edenhall hospital for, 138
Lincoln friendly societies' dispensaries (parliamentary question), 92
LIND, James, 710
LINDSAY, J. A.: Preliminary science in the medical curriculum, 75
LINNELL, Alfred: Future of medical practice from the standpoint of the general practitioner, 38
Lip reading, 533
Liquor control: Carlisle experiment, 185—Financial results of the Carlisle experiment, 838
Liquor Control Board, Central (parliamentary question), 949
Liquor Trade Bill (parliamentary question), 913. *See also* Temporary Provisions Bill
Lister Memorial Fund. *See* Fund
Literature and medicine (John E. Gemmell), 679
LITTLEWOOD, Harry: Results of peripheral nerve injuries treated by operation, 470
Liver, atrophy of (James Miller and Andrew Rutherford), 581—(Bernard H. Spilsbury), 583—(M. J. Stewart), 584—(J. W. McNee), 585—(Colonel William Hunter), 585
Liver, cirrhosis of. *See* Cirrhosis
Liver, review of books on, 550, 940
Liverpool: Plague at, 31—Tuberculosis conference in, 217—New sanatorium for, 490—Annual medical service in, 680
Liverpool Medical Institution. *See* Institution
Living, cost of (parliamentary question), 677
LIVINGSTON, George R.: Treatment of fractures, 411
Livingstone College. *See* College
LOCKET, T. Wood: Therapeutics of normal horse serum, 952
LOCKHART-MUMMERY, P: Surgical treatment of cancer of rectum, 737
LOCKYER, Cuthbert: Radiology in gynaecological practice, 539
Lodge practice (Australia), 333
LODGE, William Oliver: Case of hepatic abscess, 399
LOGIE, James Scarth Spence, obituary notice of, 138
LOMBARD, Étienne, death of, 457
LOMBROSO, Cesare, proposed monument to, 416
LOMHOLT, S.: Alcohol and venereal disease, 756

LONDON:
Association of the Medical Women's Federation. *See* Association
Asylum and hospital accommodation, 255
County Council. *See* Council
Diphtheria in, 757
Epidemics in (parliamentary question), 834
Health administration in (leading article), 285
Health of (report of medical officer), 169
Home nursing in, 870
Hospitals expenditure, 641
Lying-in homes, proposed new regulations, 221
Medical exhibition, 558
Medical schools, grants to (parliamentary question), 913
Mental hospitals and Ministry of Health Bill, 764
Post-graduate work in, 89, 863
Scarlet fever in, 757
School of Clinical Medicine, Greenwich, information concerning, 369
School of Medicine for Women, 637. *See also* Hospital, Royal Free
Small-pox precautions, 184
Tuberculosis services, 254
Water supply, 249
Zymotic diseases in, 757

Longevity in Somerset, 146, 262
Louse. *See* Lice
LOVETT, J. M.: Puerperal sepsis, 412
LOW, George C. (and Philip MANSON-BAHR): Rôle of *Filaria bancrofti* in production of elephantiasis and kindred diseases, 233—Treatment of human trypanosomiasis and kala-azar by intravenous injections of acetyl-p-aminophenyl stibiate of sodium, 236—Dietetic deficiency and endocrine activity, 238
LOW, R. Bruce: Report on incidence of plague, cholera, and yellow fever throughout the world, 943
LOWE, E Cronin: Metastases in bone from a case of renal hypernephroma, 786
LOWRY, Edith B.: *The Woman of Forty*, rev., 518
LOWSON, J. P.: Psychotherapy, 626—Early symptoms of nervous disorders, 697
LUCAS, Albert: Future position of "à la suite" officers in territorial hospitals, 800
Lucknow, wandering lepers in, 765—Medical Association and the Esher and Lovett Committee's report, 871
LUKE, T. D.: Tennis elbow, 228
Lunacy in 1919, report of Board of Control, 602
Lunacy certificates (parliamentary question), 869
Lunatics, pauper, in workhouses (parliamentary question), 291—Right of relatives to claim (parliamentary question), 913
Lung, diagnosis of hydatid disease of (Alfred Foster), 887. (O). *See also* Hydatid
Lung, head of rye grass in, removed from pleura (R. Eccles Smith), 701. (O). *See also* Foreign bodies
Lungs, acute oedema of (W. Cameron Davidson), 163
Lupus, Dutch society for combating, report, 336
Lupus vulgaris treated by liquid acid nitrate of mercury (H. G. Adamson), 123. (O)—Correspondence on, 224
Lying-in homes in London, proposed new regulations, 221
LYNCH: Intestinal pathology in the psychoses 132
LYNCH, Arthur: *The Immortal Caravel*, rev., 941
LYNN-THOMAS, Sir J.: Bonesetters *versus* the science and art of surgery, 222
Lyons Institute of Bacteriology: Endowment of annual scholarship for laboratory work on infectious diseases, 145

M.

MAASE, C.: Starvation oedema, 329
MACALISTER, Sir Donald, elected an honorary member of the Liverpool Medical Institution, 956
MACALISTER, Sir John, presentation to, 90
MCARTHUR, A. Norman: Pregnancy after ligature of Fallopian tubes, 890
MACAULAY, T. S.: Bee and wasp stings, 924
MCCALL, Sir John, estate of, 749
MCCANN, F. J.: Prevention of female sterility, 665
MCCARRISON, Lieut.-Col. R.: Quinine in pharmacology and therapeutics, 121—Vitamines in clinical medicine, 154—Dietetic deficiency and endocrine activity, with special reference to deficiency oedemas, 236
MCCARTHY, Dame Maud, appointed matron-in-chief of Territorial Force Nursing Service, 143
MCCARTHY, Captain Philip Augustine, obituary notice of, 298
MCCARTNEY, John: Sodium biborate in the treatment of epilepsy in an asylum, 548. (O)
MCCRAE, Thomas (and Sir William OSLER): *The Principles and Practice of Medicine*, rev., 822
MCDONAGH, J. E. R.: *Venereal Diseases: Their Clinical Aspect and Treatment*, rev., 439—Action of chemiotherapy, 660. (O)—Latent syphilis in pregnancy, 785
MACDONALD, D. M.: Warming apparatus for fingers with Raynaud's disease, 571
MACDONALD, J. A., retires from Chairmanship of Council, 24—Presentation to, 129, 183, 213, 247, 289, 402, 488, 559, 640, 863
MACDONALD, Peter: State and future of the medical profession, 46, 450—Risks after operation for tonsils and adenoids in out-door clinics, 990
MCDOUGALL, William (and May SMITH): Alcohol, fatigue, and mental activity, 710
MCDOWALL, Stewart A.: *Beauty and the Beast: An Essay in Evolutionary Aesthetic*, rev., 168
Macedonia, blackwater fever in (J. F. Gaskell), 122. (O)—(A. Goodall), 126
MACEWEN, John A. C.: Perforated gastric ulcer with extraperitoneal escape of contents, 630—*Fractures, Compound Fractures, Dislocations, and their Treatment*, rev., 861
MACEWEN, Sir William, elected President of the International Society of Surgery, 408—Carcinoma of the extremities of the alimentary tract, tongue, and rectum, 922
MCFARLANE, T. F., obituary notice of, 496
MACFIE, J. D.: The tuberculosis campaign, 295
M'GONIGLE, G. C. M.: Cereal ears as foreign bodies, 806
MACHT: Psycho-pharmacology, 216—Therapeutics of benzyl compounds, 406
MACKAY, Charles: Place of muscle re-education in treatment of anterior poliomyelitis (infantile paralysis), 513, (O) 841—Letters on, 841, 953
MACKAY, Helen M. M.: Observations on cases of rickets in an out-patient department, 929. (O)
MACKAY, Jas. D.: Fish bone in Wharton's duct, 592
MCKENDRICK, A.: Relations of disease and injury, 203. (O)
MACKENNA, R. W.: Colloidal preparations, 745
MACKENZIE, Sir James, appointed honorary physician to the King in Scotland, 134—Medical education, 680
MACKENZIE, Marion: Venereal disease in women and children, 197, 201—Mortality of venereal diseases, 568
Mackie expedition to Central Africa, 915
MACKLIN, Alys Eyre: *Crises*, rev., 747
MACLACHLAN, John T.: Puerperal sepsis, 418
MACLEAN, George E.: American graduates in Europe: London's opportunity, 492
MACLEAN, Hugh, appointed director clinical medical unit at St. Thomas's Hospital, 832
MCLEAN, Hugh (and Cavendish FLETCHER): *The Link between the Practitioner and the Laboratory*, rev., 788
MACLENNAN, Alex.: Hyperidrosis, 957
MCMURRICH, J. Playfair: *The Development of the Human Body: A Manual of Human Embryology*, rev., 981
MCNAIR, Dr.: Placenta praevia with vasa praevia delivered by Caesarean section, 665
MCNEE, J. W. (and Arthur COOKE): Demonstration in blood transfusion, 111—Atrophy of liver, 585
MACPHAIL, Alexander, appointed a medical officer of the Ministry of Health, 559
MACPHAIL, S. Rutherford, dinner to, 571
MACPHERSON, W. G.: Venereal diseases among seamen, 840
MACRAE, Alex.: Posture in defaecation, 418
MCRITCHIE, P.: Case of urinary sinuses, 516
MCWALTER, J. C.: Preliminary science in the medical curriculum, 74—D.Litt. conferred upon by University of Ottawa, 97—Quinine in pharmacology and therapeutics, 120—Can one work with intracapsular fracture of femur? 413—Tartar emetic and its toxicity, 498—Influence of dilution on the toxicity of alcohol, 722

Magendie, existence of the foramen of, 526
MAGILL, Ivan W.: Forceps for intratracheal anaesthesia, 670
Mails by air, 458
MAKINS, Sir George: Surgical treatment of gastric ulcer, 108—Surgical treatment of cancer of rectum, 742
Malaria bureau reports of the Federated Malay States, 416
Malaria-carrying properties of the various species of anophelines, 416
Malaria, malignant tertian, fatal case of contracted in the North of England (Ernest E. Glynn and J. C. Matthews), 811. (O)—Note on, 830—Correspondence on, 871
Malaria, review of books on, 631
Malaria treatment, compound tinctures in, 299
Malarial parasite infects *Anopheles plumbeus*, 697
Malay States: Malaria bureau reports, 416—Diminution of beri-beri in, 942
Maltesco, 552
Manchester: Neurasthenic cases in (parliamentary question), 182—Air of (parliamentary question), 182—Medical War Committee, final report of, 566—Edinburgh University Club dinner, 680—Hospital question in, 763
MANN, H. Corry: Vitamines in clinical medicine, 157
Mansfield House University Settlement, 97
MANSON, J. S.: Hereditary spastic paraplegia with ataxia and mental defect, 477
MANSON-BAHR, Philip (and George C. Low): Rôle of *Filaria bancrofti* in production of elephantiasis and kindred diseases, 233
MANSON-BAHR, Philip: Treatment of human trypanosomiasis and kala-azar by intravenous injections of acetyl-p-aminophenyl stibiate of sodium, 235—Dietetic deficiency and endocrine activity, 238
Mappin bequests, 863
MARCHANT, J. (editor): *Control of Parenthood*, rev., 596
Margarines, vitamines in, 951. *See also* Oils, fat-soluble content of
MARIE, A. (and C. LEVADITI): La paralysis générale est due à un tréponème distinct de celui de la syphilis banale, 522
Marriages, consanguineous, effect of in-breeding and (leading article), 522
MARSDEN, H. H.: Delivery of child and placenta in unruptured membranes at term, 846
MARSH, Major C. J., called to the Bar, 31
MARSHALL, A. M. (and C. H. HURST): *Junior Course of Practical Zoology*, rev., 669
MARSHALL, C. F.: Mortality of venereal diseases, 225, 334
MARSHALL, J. N.: Future of the medical services: a successful cottage hospital, 93
MARTIN, A. F.: Acidosis in disease, 73
MARTIN, A. J: Coal miner's nystagmus and its predisposing cause, 814. (O)
MARTIN, E. (and others): *White and Martin's Genito-urinary Surgery and Venereal Diseases*, rev., 897
MARTIN, Frank: Dislocation of humerus by muscular action, 418
MARTIN, J Middleton: Gloucestershire scheme for extension of medical services, 916
MARTINDALE, Louisa, appointed J.P. for Brighton, 144—Intensive *x*-ray therapy in treatment of uterine fibromyomata, 538
MARTINDALE, W. H. (and W. W. WESTCOTT): *The Extra Pharmacopoeia*, rev., 78
MARTLEY, F. C.: Municipalization of hospitals, 643, 766
MASON, V. R.: Hereditary spastic paraplegia, 217
Massage establishments and the London County Council, 799, 956
Masseurs, blind, completion of first year's work of the association of, 457—An appeal to medical men, 757, 768, 804
Masseuses Society and Institute of Massage, amalgamation of, 408
MASTERMAN, E. W. G.: Venereal disease in women and children, 197, 201
MASTERS, Walter E.: *Essentials of Tropical Medicine*, rev., 551
Mastitis, gonorrhoeal, case of (W. H. F. Oxley and J. Dundas), 744—Correspondence on, 843
Maternity and child welfare (Lieut.-Col. F. E. Fremantle), 213—In India, 292, 870—Ministry of Health compiles a list of residential institutions in England and Wales in connexion with, 337, 497—Parliamentary questions, 714, 796—Woman practitioner to be appointed, 805—In France (Dr. Vidal), 909
MATTHEWS, J. C. (and Ernest E. GLYNN): Fatal case of malignant tertian malaria contracted in the North of England, 811. (O)
MATTICK: Cleansing of churns, 488
MAW, Gerald W.: Atropine in sea-sickness, 190
MAY, Otto: Treatment of denervated muscle, 294—Venereal diseases among seamen, 840
MAYERHOFER, E. (and C. von PIRQUET): *Lehrbuch der Volksernährung nach dem Pirquetschen System*, rev., 666
MAYLARD, A. Ernest: James Watson lectures on some chronic gastric disorders, 831
MAYNARD, Lieut.-Col. F. P.: Left-hand drives, 66—*Manual of Ophthalmic Operations*, rev., 705—*Manual of Ophthalmic Practice*, rev., 705
MAYO, Charles H., dinner to, 62—Honorary F.R.C.S. conferred upon, 90—Surgical treatment of gastric ulcer, 103—Treatment of calculi impacted in pelvic portion of the ureter, 163—Surgical treatment of cancer of rectum, 741
MAYO, F. H.: Advances in the practice of medicine, 666
MAYOU, M. Stephen: *Diseases of the Eye*, rev., 705
MEACHEN, G. Norman: *Tuberculosis*, rev., 824
MEARS, Frederick Charles, obituary notice of, 336
Meat diet in sprue (Philip Conran), 206. (O)—Correspondence on, 293
Meat for human consumption and slaughter of animals, Ministry of Health appoints committee to report on, 65
Medical Act, new Australian, 255
Medical agents and money lenders, 448
Medical appeal boards, attack on (parliamentary question), 181
Medical aspects of war tanks, 909
Medical aspects of workmen's compensation: Report of Departmental Committee, 133
Medical barristers, 31, 845
Medical calendar, a Dutch, 958
Medical centenarian (J. S. S. Logie), 138
Medical certificates and unemployment benefit, 898. *See also* Insurance
Medical Consultative Council, interim report (leading article), 87
Medical cricket club, 300
Medical curriculum, place of preliminary science in (Sir George Newman), 8—(Sydney J. Hickson), 12—(Arthur Keith), 15—(Sir E. Rutherford), 16—(J. Lorrain Smith), 17—(Arthur Smithells), 19—Discussion, 73—Leading article, 88
Medical Defence Union: Annual meeting, 489—Election of officers, 571
Medical Directory, 1921, 64—Review, 940
Medical education, 295
Medical education: In Peking, 292—At St. Mary's Hospital, 559
Medical education, international problem of (Piero Giacosa), 824
Medical education of women, 363, 367
Medical examination of women claimants for pensions (parliamentary question), 63
Medical examinations, latest statistics (parliamentary question), 254
Medical exhibition, the London, 558
Medical Insurance Agency, progress of, 946
Medical journals, early, 907, 958
Medical journals in Italy, price to be raised, 337
Medical jurisprudence, review of books on, 550, 860
Medical magistrates, 144, 416, 875, 956
Medical mayors, 771
Medical men, insurance for, 946
Medical men in the United States, two-thirds use motor cars, 497
Medical missionaries: Information concerning, 378—Edinburgh Society of, 832
Medical officers, appointment of (parliamentery question), 986
Medical papers for Ludhiana College, India, 806
Medical police fees. *See* Fees
Medical practice in British colonies and foreign countries, information concerning, 377
Medical practice in Italy, 190
Medical practice, the State and the future of (Sir George Newman), 33—(Sir Wilmot Herringham), 36—(Alfred Linnell), 38—(Gowland Hopkins), 40—(E. W. Morris), 42—Discussion on, 45, 750—(Peter Macdonald), 450—(Lord Dawson of Penn), 750
Medical problems of flying (leading article), 443
Medical profession and co-operation, 146
Medical Radiology Congress. *See* Congress
Medical record cards. *See* Insurance
Medical Register, change of address (names of practitioners who have not responded to inquiries), 171—Note on, 180
Medical requirements for air navigation. *See* Air
Medical research, conditions of (Sir Almroth Wright), 797

MEDICAL RESEARCH COUNCIL:
Arranges for gum acacia sterilized solutions to be placed on the market, 66
Report on laboratory diagnosis of acute intestinal infections, 215
Report to on the medical problems of flying, 443
Report to on the science of ventilation and open-air treatment, 484
Report on the influence of alcohol on mental activities, 710
Report to on subacute infective endocarditis (Thomas F. Cotton), 851
Report of committee on toxic effect of salvarsan, 945

Medical research and education (Swale Vincent), 562
Medical research, future of medical practice from the point of view of (Gowland Hopkins), 40. *See also* Medical practice
Medical research and the universities (Sir Clifford Allbutt), 1. (O)—Leading article on, 22. *See also* Universities
Medical resettlement, 259, 296, 337, 418

MEDICAL SCHOOLS AND COLLEGES:
Appointments under the Colonial Office, 378
Clinical hospitals in England, 366
Degrees for practitioners, 367
Dental surgery, 378
Indian Medical Service, 376
Information concerning the study of medicine, 339 et seq.
Medical education of women, 363, 367
Medical missionaries, 378
Medical practice in British colonies and foreign countries, 377
New session opened, 562, 642
Post-graduation study, 367
Prison medical service, 377
Psychological medicine, 371
Public health services, 371
Public services, 373
Royal Air Force, 375
Royal Army Medical Corps, 373
Royal Navy, 373
Scholarships, 343 et seq.
Tropical medicine, 370

Medical schools of London, grants to (parliamentary question), 913
Medical service in Mesopotamia and Persia (parliamentary question), 913
Medical service scheme (Thomas de la Rue and Co.), 331
Medical service scheme for Scotland: Report of Scottish Consultative Council, 900. *See also* Consultative Council *and* Health Ministry
Medical service, unified. *See* Medical service in India
Medical Services, Deputy Commissioner of (parliamentary question), 913
Medical services in India (leading article), 555—Correspondence on, 608, 801
Medical services: Future provision of, 29, 83, 93, 140—Meeting at Bristol, 83—Meeting at Bath, 84—Leading article, 87—Correspondence on, 93, 140, 186, 228 842, 916—A successful cottage hospital, 93—The Poor Law Medical Service, 140—Gloucestershire scheme for extension of, 842, 916, 952
Medical students, increase of number of in Germany, 170

MEDICAL AND SURGICAL APPLIANCES AND PREPARATIONS:
Ampoule-syringes, 942
Concave burr, 211
Electrical aids for the deaf, 897
Forceps for intratracheal anaesthesia, 670
Glass retractors for cerebral surgery, 941
Light filters for the microscope, 79
Nutresco products, 551
Obstetrical belt, 211
Pipette for automatic measurement of constant volumes, 480
Stethoscope, an adjustable, 941
Surgical needle, a new, 481
Throat irrigator and spatula combined, 168

Medical treatment during demobilization furlough (parliamentary question), 219
Medical use of spirits (parliamentary question), 63
Medical Women's Federation: Note on prophylaxis of venereal disease, 942
Medical work, scientific, in South Russia, 641
Medicina Curiosa, the first English medical journal, 907
Medicine, clinical, present position of vitamines in (F. Gowland Hopkins), 147—(Sir James Barr), 150—(Harriette Chick), 151—(Elsie J. Dalyell), 152—(Lieut.-Col. R. McCarrison), 154—(Dr. Hess), 154—(Geo. F. Still), 155—(Leonard Williams), 156—(H. Corry Mann), 157—(W. H. Willcox), 158—(Eric Pritchard), 159—(S. Monckton Copeman), 159—Discussion, 160. *See also* Deficiency diseases
Medicine at the end of the eighteenth century (Sir W. Hale-White), 598
Medicine: Culture and the practice of (leading article), 215
Medicine in the *Encyclopaedia of Religion and Ethics*, 910
Medicine, foundations of (leading article), 483
Medicine and the law (Lord Justice Atkin), 747, 910—Note on, 946
Medicine and physiology, relation of (Thomas Lewis), 459 (O)—Leading article on, 483—Note on, 525
Medicine, practical, recent advances in science in their relation to (F. Gowland Hopkins), 862
Medicine, preventive, and the Ministry of Health (Sir George Newman), 635
Medicine, profession of (leading article), 339
Medicine, radiologist in (Alfred Ernest Barclay), 385
Medicine, review of books on, 401, 822
Medicine in the schools: report of chief medical officer of Board of Education, 761, 826
Medicine, science in, birth and growth of (Sir Frederick Andrewes), 615. (O)—Leading article on, 636
Medicines, prescribing and dispensing of, Pharmaceutical Society's resolution *re*, 821

Medico-Legal:
Bogus doctor (Mellor), 456
Charges of fraud in insurance practice (John Thomas Godfrey), 992
Doctor's libel action (Davies *v.* Rolleston), 30
Libel action against a medical officer of health (Copeland *v.* Orr), 188
Panel doctor's slander suit (Gaitskill *v.* Thornycroft and wife), 30

Medico-political matters in Tasmania, 81. *See also* Tasmania
MEISNER, W. (and A. BRÜCKNER): *Grundriss der Augenheilkunde für Studierende und praktische Aerzte*, rev., 596
Melancholia, involuntary (Dr. Menzies), 321
Melbourne, influenza in, in 1919, 951
MELLANBY, Professor: Experimental rickets, 989
MELLOR (bogus doctor) sentenced, 456
MENDELSON, R. W.: Note on a case of Castellani's acladiosis, 664
Meningeal tumour. *See* Tumour
Meningitis, cerebro-spinal, discussion on the bacteriology of, 420. *See also* Fever, cerebro-spinal
Meningococcus "carrier" question (C. W. Ponder), 427—(J. Alison Glover), 428—Correspondence on, 493
MENNELL, James B.: Tennis elbow, 228—*Massage: Its Principles and Practice*, rev., 824
Mental disorder, incipient, treatment of, 332, 410, 722
Mental disorder, treatment of, 146
Menstruation during school life (Alice E. Sanderson Clow), 511. (O)—Correspondence on, 568, 924
Mental deficiency, review of books on, 549
Mentally defective: Report of Special Schools After-care Subcommittee of City of Birmingham, 205—Institutions for (G. A. Auden), 212
MENZIES, Dr.: Mechanism of involuntary melancholia, 321
MERCIER, Charles A.: Probate Court decides in favour of his will, 922
Mercury, liquid acid nitrate of in treatment of lupus vulgaris (H G. Adamson, 123. (O)
Mesopotamia: Health of troops in (parliamentary question), 182—Kala-azar in, 335—A medical society in, 639—Casualties in (parliamentary question), 796—Medical service in (parliamentary question), 913
Methylated spirits. *See* Spirits
Metric system, 953
Metron, a journal of statistics, 712
Metropolitan Asylums Board. *See* Board
Metropolitan Police. *See* Police
Metropolitan Public Gardens Association. *See* Association
Michelin Guide, rev., 402—*The Somme*: Vol. I, *First Battle of the Somme (1916-1917)*, *Albert, Bapaume, Peronne*, rev., 551
Microscope, light filters for, 79
Microcosm, the poetry of the, 898
MIDELTON, W. J.: Treatment of whooping-cough, 190—Tennis elbow, 300—Skin eruptions and internal infections, 498—Climate in rheumatoid arthritis, 572
Midwifery practice, some points in (W. J. Young), 927 (O)—Correspondence on, 991
Midwives Board. *See* Board
MILES, W. Ernest: Surgical treatment of cancer of rectum, 730
Military Medicine Congress. *See* Congress
Milk, clean, production of, 458
Milk, condensed, standardization of (parliamentary question), 291, 796
Milk and Dairies Bill, 913
Milk imported from Denmark (parliamentary question), 182
Milk, dried, directions for using, 335—Correspondence on, 412—Absence of tubercle bacilli from, 876
Milk licences, number of (parliamentary question), 92
Milk, tuberculous, discussion on, 603—Correspondence on, 610, 643, 682, 721, 766, 801, 872—Review of book on, 894—Leading article on, 906
Milk, use of, 713
MILLAR, W., awarded Government grant for successful vaccination for sixth time, 922
MILLARD, C. Killick: Vaccinal condition of small-pox carriers, 95, 258
MILLER, D. A. (and James YOUNG): Etiology of eclampsia and the pre-eclamptic state, 976
MILLER, H. Crichton (editor): *Functional Nerve Disease*, rev., 439—Psychotherapy, 624
MILLER, James (and Andrew RUTHERFORD): Atrophy of the liver, 581
MILLIGAN, Sir William: Risks after operation for tonsils and adenoids in outdoor clinics, 990
MILLS, G. Percival: *Practical Hints on Minor Operations*, rev., 705
MILROY, T. H.: Acidosis in disease, 72
Mine rescue apparatus, second report of Research Committee, 283
Miner's nystagmus. *See* Nystagmus
Mines, coal, prevention of explosions in, 446
MINETT, E. P.: *Practical Tropical Sanitation*, rev., 551
Ministry of Health. *See* Health
Ministry of Health Bill, 795. *See also* Miscellaneous Provisions Bill
Miscellaneous Provisions Bill of the Ministry of Health, 290, 327, 331, 682, 713, 757, 762, 764, 795, 833, 868, 911, 947 (*see also* Health Ministry)—Leading article, 982
Missing officers and men, number of (parliamentary question), 92
Missionaries, medical, information concerning, 378
MITCHELL, Andrew, obituary notice of, 97
MITCHELL, Trafford, obituary notice of 298
MITCHELL, W. Drew: Outward dislocation of head of radius, 399
MITCHELL, William: Treatment of uterine fibroids, 541
Mitral stenosis, left recurrent laryngeal paralysis in, 946
MODI, Rai Bahadur Jaising P.: *A Textbook of Medical Jurisprudence and Toxicology*, rev., 550
Mole, hydatidiform: perforation of uterus (R. C. Harkness), 744
MOLYNEUX, Echlin S.: Two cases of carcinoma alive eight years after radium treatment, 548. (O)
Money lenders and medical agents, 448
Monomethylarsenate of soda in typhus, 458
MONSARRAT, K. W.: *The Red Halls and other Verses*, rev., 862—Is cholecystectomy the normal operation in cholecystitis? 892
Monstrosities, 828. *See also* Anencephalic *and* Teratological
MONTAZ: Pleural reflex syncope, 26
Montessori system, rev., 747
MOODIE, A. R.: Two cases of double glioma retinae, 856 (O)
MOORE, Craven: Diagnosis of nervous disorders of stomach and intestine, 508
MOORE, C. R. (and F. R. LILLIE): *Laboratory Outline of Embryology, with special reference to the Chick and the Pig*, rev., 324
MOORE, Sir Norman, elected President of the Johnson Society, 496
MOORHEAD, S. W. (and others): *White and Martin's Genito-urinary Surgery and Venereal Diseases*, rev., 897
MORETON, T. W. E.: Medical resettlement, 418
MORLEY, Arthur S.: Solution of the hospital problem, 720
MORLEY, John: Clinical manifestations of the mobile proximal colon, 542 (O)—Letter on, 644, 683
MORRIS E. W.: State and future of medical practice—the hospitals, 42—London Hospital catgut, 614
MORRIS-JONES, J. H.: Coroners' inquests, 454
MORSON, Clifford: Treatment of calculi impacted in the pelvic portion of the ureter, 454 530
Mortality in India, 765
Mortality, infantile, in Bengal, 765
MORTON, William Thomas Green, elected to the American Hall of Fame, 771
Mothers, unmarried, and the child, 876
Motor cars: Left-hand drives, 66—Speed limits (parliamentary question), 92—Engine starting, 146—Two-thirds of the medical men in the United States possess cars, 497—*The Dunlop Book: The Motorists' Guide, Counsellor, and Friend*, rev., 897—Number plates for motor vehicles, 924—Renewal of, 958
Motor notes for medical men (H. Massac Buist), 27, 82, 441, 604, 715, 760
Motor scooters, 845
Motor spirit duty revenue (parliamentary question), 26
Motoring in France, 806
Motorists and overhanging hedges, 614
MOTT, Sir Frederick: Early symptoms in nervous disease, 695—Reviews A. van Gehuchten's book on neurology, 703—Influence of music on body and mind, 771—Pathology of dementia praecox, 781
MOTTRAM, J. C.: Cancer research, 655
MOULINIER, René (and René CRUCHET): *Air Sickness, its Nature and Treatment*, rev., 401
MOULLIN, C Mansell: Blind masseurs, 768
MOURIER, M., appointed chief of the Assistance Publique in Paris, 993
Mouth and eye in sleep. *See* Sleep
Mouth and lip operations, intratracheal anaesthesia by the nasal route for (Stanley Rowbotham), 590. (O)
MOYNIHAN, Sir Berkeley: Surgical treatment of gastric ulcer, 99—Delivers the first Murphy Memorial Oration at Montreal, 573—Speech at presentation of mace to American College of Surgeons, 598—Malignant disease of the colon, 890
Muco-membranous colitis. *See* Colitis
Mucous secretion, obstructed (J. Lewis Thomas), 857
Mucus formation and catarrh. *See* Catarrh
Mucus, function of, 681
Mumps epidemic in St. Kilda, 839
MUNRO Robert, obituary notice of, 298
MURPHY, J. F.: Furuncle of anterior nares, 648
Murphy Memorial Oration: The first is delivered by Sir Berkeley Moynihan at Montreal, 573
MURPHY, Sir Shirley, elected Master of Society of Apothecaries, 337
MURRAY, E. Farquhar: Labour complicated by marked elongation of the supravaginal cervix, 549
MURRAY, George R.: Diagnosis and treatment of some diseases of the endocrine glands, 807. (O)
MURRAY, H. Leith: Serums and vaccines in the treatment of puerperal infection, 269
MURRAY, J. A.: Present position of cancer research 653
MURRAY, Jessie Margaret, obituary notice of, 723
MURRAY, William, death of, 559—Obituary notice of, 611
Muscle, denervated, treatment of, and on the "disuse" theory (J. N. Langley), 239—(E. P. Cumberbatch), 240—(W. J. Turrell), 241—(F. Hernaman-Johnson), 242—(E. D. Adrian), 242—(Noel H. M. Burke), 242—(Ff. Roberts), 242—Correspondence on, 294
Muscle, postural activity of, 288
Muscle re-education in poliomyelitis. *See* Poliomyelitis
Music, influence of on body and mind (Sir Frederick Mott), 771
MUTHU, C., dinner to, 145—Vitamines in clinical medicine, 160—Tuberculous milk, 644, 872
MYERS, Charles S.: *Mind and Work*, rev., 896
Myopia (H. M. Traquair), 126—(Correspondence on, 262

N.

Naevus, urethral, 806
NANCE, H. Chester: "Death after tonsillectomy," 645
NANKIVELL, B. W.: Taenia voided by the mouth, 32
Nares, anterior, treatment for staphylococcal infection of, 614, 648, 686. *See also* Furuncle
Nasal accessory sinuses, inflammatory lesions of (Herbert Tilley), 962
Nasal anatomy collection, 755
National Association for Prevention of Tuberculosis. *See* Tuberculosis prevention
National Council of Social Services issues a handbook on the public services, 634
National health and Government subsidies. *See* Government *and* Health Ministry
National Relief Fund makes a grant to voluntary hospitals, 331, 866—Special distribution committee appointed, 866
Nature's teratological experiments (leading article), 828
Naval hygiene, founders of (leading article), 710
Naval medical service as a career, 917—Correspondence, 953, 991
Naval medicine, American, a pioneer in (W. P. C. Barton), 90
Naval, military, and air force hygiene, 414
Naval officers' peace uniform, special grants for (parliamentary question), 92
Navy, Royal: Information concerning the medical service of, 373—Admiralty fees for civil practitioners, 724—Statistical report of the health of for 1914 issued under date of January 1st, 1920, 793—The medical service as a career, 917, 953, 991
NEAL, James: Water rates in dispensing practices, 842
NEEDHAM, Joseph, obituary notice of, 259
Needle, new surgical, 481
NELSON, H. G. G.: Free gas in the peritoneum and subsequent subcutaneous emphysema, 280
Neo-salvarsan: woman who had had three abortions gives birth to living child after treatment, 244
Neo-salvarsan, numerous preparations of sold in Austria found to contain no salvarsan, 123
Nephritis, subacute, treated by kidney decapsulation (Sir Thomas Horder), 727. (O)—Discussion on, 744
Nerve disease, review of books on, 439
Nerve injuries, condenser tests in diagnosis and prognosis of (Cecil Worster-Drought), 389
Nerve injuries, place of electricity in diagnosis and treatment of (H. S. Souttar), 387
Nerve injuries, review of books on, 595
Nerve injury causing paralysis (H. S. Souttar), 387—(Noel H. M. Burke), 388—(Cecil Worster-Drought), 389—Discussion, 390
Nerves, value of electrical testing of at operation (Noel H. M. Burke), 388
Nerves, peripheral, degeneration and regeneration of (J. G. Greenfield), 783
Nerves, peripheral, end-results of injuries to, treated by operation (Sir William Thorburn), 462—(Percy Sargent), 464—(Maud F. Forrester-Brown), 467—(James Alane Copland), 468—(J. L. Joyce), 468—Discussion, 469
Nervous disease, early symptoms and signs of (Henry Head), 691—(James Collier), 693—(Gordon Holmes), 694—(F. M. R. Walshe), 694—(Theodore Thompson), 695—Sir Frederick Mott), 695—(E. S. Reynolds), 695—(Tom Williams), 695—Discussion, 696—Correspondence on, 800

Nervous disorders of stomach and intestine (Arthur F. Hurst), 499—(T. Izod Bennett), 503—(Thomas R. Brown), 503—(W. Langdon Brown), 504—(H. Tyrrell Gray), 505—(R. J. M. Buchanan), 506—Discussion on, 507—Correspondence on, 610
Nervous and functional dyspepsias. *See* Nervous disorders
NETTER: Lethargic encephalitis, 829
NEUBERGER, Max, elected honorary member of Society of Medical History of Chicago, 139
NEUMANN, R. O. (and K. B. LEHMANN): *Atlas und Grundriss der Bakteriologie und Lehrbuch der speziellen Bakteriologischen Diagnostik*, rev., 788
Neuralgia, lingual, and gingivitis, persistent, 457
Neuralgia of tongue, chronic, with persistent gingivitis, 993
Neurasthenic cases: In Manchester (parliamentary question), 182—In Ireland (parliamentary question), 182
Neurasthenia, occupation treatment of, 994
Neuresco, 551
Neuritis, optic, due to deutal sepsis (H. W. Archer-Hall), 399
Neurological jottings: II, Chicken-pox and herpes, disseminated sclerosis (James Taylor), 436. (O)
Neurology, review of books on, 127, 703, 861
Neuroses, traumatic, Departmental Committee appointed, 408—(Parliamentary question), 713
Newborn, umbilical diphtheria in, 911
Newcastle-upon-Tyne: Post-graduate courses at, 221—Condemned food at (parliamentary question), 291—New orthopaedic hospital opened, 457—Appeal by the Colleges of Medicine and Science, 838—Eighty-ninth annual meeting of the British Medical Association at, 902
NEWELL, A. G.: Blackwater fever, 873
NEWMAN, Sir George: Place of preliminary science in the medical curriculum, 8 74—The State and the future of medical practice, 33—Hunterian Lecture on preventive medicine and the Ministry of Health, 635

NEW SOUTH WALES:
Birth rate, 185
Influenza epidemic and the death rate, 185, 481—Report on, 481
Leprosy statistics, 752
Sydney University: New dean of the Faculty of Medicine, 185—Resignations, 491—New professorships, 491
Universities' conference, 491
See also Australia

New Zealand, research into etiology of goitre in, 457
Nice discrimination, 98
NICOLL, Maurice: Psychotherapy, 625
NICOLLE, M.: *Les Antigènes et les Anticorps: Caractères général, applications diagnostiques applications thérapeutiques*, rev., 941
NIERENSTEIN, M.: Quinine in pharmacology and therapeutics, 120
Night-shirt collar causes suffocation, 288
Nitrous-oxide gas. *See* Gas
NIXON, J. A.: Tennis elbow, 261—Diagnosis of nervous disorders of stomach and intestine, 507
Nobel prize for medicine for 1919 and 1920, 713
NOLF, P.: Intravenous peptone, 328
Nomenclature of diseases, 843, 865. *See also* Diseases
NONNE, Professor, awarded Erb medal, 844
NORBYE, H.: Suffocation by collar of a night-shirt, 288
NORGATE, R. H.: Arrest of growth in "inoperable cancer of the jaw," 280
NORMAN, Ralph, presentation to, 805
NORMAN, Vice Admiral Sir William, appointed honorary surgeon to the King, 299
Norway, leprosy in, 795

Notes, Letters, Answers, etc.:
Abdominal operation in 1701, 498
Acidosis in disease: A correction, 190
Adminson, Limited (for beekeepers), 994
Advertisement of practice. *See* Practice
Air mails, 458
Anaesthetic fees in the provinces, 994
Anglo-American University Library for Central Europe, 924
Antimony in leprosy, 498
Antivivisection in America, 924
Aseptic catheters, 875
Aspirin, poisoning by 2½ grains of, 300
Atropine in sea-sickness, 190
Babies, judging of, 146
Bedpan with straight sides, 457
Bee and wasp stings, 924
Bee World, a journal for beekeepers, 994
Bonesetters *versus* the science and art of surgery, 300
British research chemicals, 686
Bullinus or *Isidora*, 648
Burke's Peerage, a pamphlet on, 994
Cancer prevalence and insanitary housing, 337
Cancer, treatment of, 228
Carbon tetrachloride poisoning, 497
Cases, group of unusual, 726
Catgut, London Hospital, 614
Catgut, sterile, 98
Catheters, aseptic, 875
Cereal ears as foreign bodies, 806, 84

Notes, Letters, Answers, etc. (*contd.*):
Cerumen, 726
Cholera in a new country, 418
Circumcision, 32
Climate in rheumatoid arthritis, 497, 572, 614
Cocoa, Cadbury's, samples of, 686
Colitis, muco-membranous, 725, 772
Colotomy, treatment after, 417
Cord, prolapse of, 338
Corrections, 98, 190, 228, 262, 686, 924
Cottage hospital organization, 190
Cystotomy, permanent, treatment of, 771
Dairying, scheme to improve, 772
Decimal point, 497
Delivery of child and placenta in unruptured membranes at term, 846
Depilatories, 228, 300 418
Diaphragmatic hernia, congenital, 32
Dictionaries for reference, 771
Disclaimer, 958
Dispensing, 876
Drunkenness, habitual, and the public health authority, 458
Dutch medical calendar, 958
Dysidrosis, 957
Electrical apparatus, 572
Engine starting, 146
Ergot and iron mixtures, 458, 498
Errata. *See* Corrections
Faucial angina, 262
Fees for coroners' inquests, 726, 772, 876
Fees of county council lecturers, 66
Five great-grandparents alive, 806
Four maternal great-grandparents alive, 772
Furuncle of anterior nares 648, 686
Gallstones and parsley, 338, 498
Gas fires, intensifier for, 648
German doctors in Alsace and Lorraine, 686
Gingivitis, persistent, and lingual neuralgia, 457
Great grandparents, four alive, 772—Five alive, 806
Guthrie, the late Dr. Leonard, 498, 876
Heart dilatation, 417
Holding the door ajar, 686
Hospital residents, unmarried, 686
Hospital trade union, 534
House-flies and disease, 418
House-surgeons, three generations of, 924
Humerus dislocated by muscular action, 300, 418
Hyperidrosis, 845, 876, 957
"Included foetus," 497
Income Tax, 32, 66, 98, 145, 189, 227, 261, 299, 337, 380, 417, 457, 497, 534, 571, 614, 648, 686, 726, 772, 806, 845, 876, 923, 957, 993—Computation of income tax 1920-21, 417—Renewal of motor cars, 958
Inebriates (young), institution for, 725
Is life worth living? 994
JOURNAL, the, 958
Kandy, Ceylon, climate of, 457, 533
Kata-thermometer, 685
Left-hand drives, 66
Legumes in beri-beri, value of, 66
Lip reading, 533
Longevity in Somerset, 146, 262
Louse as a disease carrier, 923
Malaria treatment, compound tinctures in, 299
Medical cricket club, 300
Medical police fees, 458
Medical papers for Ludhiana College, India, 806
Medical practice in Italy, 190
Medical profession and co-operation, 146
Medical resettlement, 337, 418
Medical services, future provision of, 228
Menstruation during school life, 794
Mental disorders, treatment of, 146
Milk, clean, production of, 458
Milk, dried, absence of tubercle bacilli from, 876
Mothers, unmarried, and their children, 876
Motor scooters, 845
Motor vehicles, number plates for, 924
Motoring in France, 806
Motorists and overhanging hedges, 614
Myopia, 262
Neuralgia of the tongue, chronic, with persistent gingivitis, 993
Neurasthenia treatment, occupation in, 994
Nice discrimination ("physician and friend" or "herbalist"), 98
Obstetrical rarities, 686, 772
Oyster's consolation, 262
Paracentesis abdominis, 686
Pensions appointments, 261
Pensions, disablement, reduction of, 262
Petrol licence refunds, 648
Pituitary extract in obstetrics, 146
Poisoning by small doses of aspirin, 418
Posture in defaecation, 300, 418, 498, 846, 923
Practices, advertisement of, 338
Psoriasis, treatment of, 806
Public gardens, 846
Public health in Egypt in 1918, 572
Public posts, unsuccessful applications for, 924, 994
Puerperal sepsis, 418
Radial pulses, disappearance of, under deep inspiration, 958, 994
Rats and plague, 66
Research and the general practitioner, 261
Rôle, 300
Royal Earlswood Institution, 458

Notes, Letters, Answers, etc. (*contd.*):
Science teaching at Cambridge in the seventies, 572
Seborrhoea, 497
Seborrhoea capitis, obstinate oily, treatment of, 614
Skin eruptions and internal infections, 498
Smith's Medical Visiting List, 994
Sneezing and cough, paroxysmal, 98
South Africa as a resort for the tuberculous patient, 533
Spelman fund, 98
Staphylococcal infection of anterior nares, treatment of, 614
Taenia voided by the mouth, 32
Tartar emetic and its toxicity, 498
Tattoo marks, method of removing, 685
Tennis elbow, 190, 228, 261, 300, 534
Textbook as an index, 534
Three generations of house-surgeons, 924
Tinnitus aurium, 726
Tobacco tremor, 228, 300
Tonsil and adenoid disease due to dental trouble, 957
Triorchid, 498
Tubercle bacilli, absence of from dried milk, 876
Typhus treatment, 458
Ulcerative stomatitis caused by drugs, 498
Uniform clothing, reissue of to workmen, 614
Unmarried hospital residents. *See* Hospital
Unmarried mother and her child, 876
Unsuccessful applications for public posts, 924
Urethral naevus, 806
Vagina ruptured during coitus, 418
Venereal diseases among seamen, 146
Verbum sapienti, 418
Whooping-cough, treatment of, 190
Women health visitors, 648
Women's Service Bureau, 190
X-ray apparatus for small cottage hospital, 685

NOTT, Lieut.-Col. Arthur Holbrook, obituary notice of, 496
Nottingham medical officer of health on the risks of domiciliary tuberculosis, 330
Novarsenobillon, idiosyncrasy to (Major Pierce Power), 976
Novarsenobillon treatment, death from, 416
Nurses (ex-service) to be granted retired pay whilst undergoing a further course of sanatorium treatment, 927
Nursing Council, General (parliamentary question), 92
Nursing home in London, 870
Nursing staff of prison hospitals (parliamentary question), 220
Nutresco invalid food, 551
Nutresco products, 551
Nutrition, balance in (F. Gowland Hopkins), 862
Nutrition, review of books on, 666
NUTTALL, G. H. F.: Treatment of human trypanosomiasis and kala-azar by intravenous injections of acetyl-p-aminophenyl stibiate of sodium, 236
Nystagmus, coal-miner's, and its predisposing cause (A. J. Martin), 814. (O)
Nystagmus, miner's, suggestions for its prevention (D. Lechmere Anderson), 813 (O)—Correspondence on, 917, 952

O.

Obstetric anaesthesia, placenta ablata treated by pituitrin with (J. Lind Smith), 936
Obstetric and gynaecological education (Henry Briggs), 229. (O)
Obstetrical belt, 211
Obstetrical rarities, 686, 772
Obstetrics, pituitary extract in, 146
Obstetrics, recent progress in (E. Hastings Tweedy), 892
Obstetrics, review of books on, 282, 595, 787
Obstruction, acute intestinal (J. L. Joyce), 208
Obstruction, acute intestinal, caused by a herniation of small intestine into the paraduodenal fossa (Basil Hughes), 515
Occupation in the treatment of neurasthenia, 994
Occupational therapy (leading article), 445. *See also* Physical therapeutic centre
O'CONOR, Sir John: Treatment of ascites by drainage, 857. (O)
ODLUM, Lieut.-Col. William Henry, obituary notice of, 922
Oedema of lungs, acute (W. Cameron Davidson), 163
Oedema, acute pulmonary, or "acute suffocative catarrh" (John A. Henderson), 207. *See also* Catarrh
Oedema, starvation (Maase and Zondek), 329
Oedemas, deficiency, dietetic deficiency and endocrine activity, with special reference to (Lieut.-Col. Robert McCarrison), 236—Discussion, 239
Officers' dependants' allowance (parliamentary question), 64
Officers, half-pay, who require medical treatment for disabilities, 414

Officers to be granted retired pay whilst undergoing a further course of sanatorium treatment, 927
Oils, fat-soluble content of, 919. *See also* Margarine *and* Vitamines
On getting rusty, 489. *See also* Rusty
ONODI, A.: His collection of nasal anatomy, 755, 957
Oöphorectomy in treatment of osteomalacia (J. B. Hellier), 587. (O)
Open-air treatment and ventilation, scientific basis of (leading article), 484
Ophthalmology, review of books on, 516, 595, 632, 705, 980
Optic neuritis due to dental sepsis (H. W. Archer-Hall), 399
Optical instruments, standardization of, 712
ORDE, R. (and R. A. BOLAM): Industrial hospitals, 835
"Oriental sore," *x*-ray therapy in (J. Goodwin Tomkinson), 397
ORLEBAR, Alexander: Scopolamine-morphine narcosis in childbirth, 860
ORR, J. B. (and E. P. CATHCART): *Energy Expenditure of the Infantry Recruit in Training*, 521
ORRIN, H. C.: *The X-ray Atlas of Systemic Arteries of the Body*, rev., 895
Orthopaedic lectures in Paris, 875
Orthopaedic surgeons, the supply of, 843
Orthopaedic surgery in relation to hospital training (Sir Robert Jones), 773. (O)—Leading article on, 791—Correspondence on, 843
Orthopaedic surgery, papers read at special meeting of British Orthopaedic Association, 320
Orthopaedic surgery, prize for, 856
Orthopaedic surgery, status of, 921
Orthopaedics, importance of (leading article), 791
Orthopaedics, review of books on, 128, 746
ORTON, John, presentation to, 725
OSLER, Sir William: Memorial to, 63, 169—Account of in *The Annals of Medical History*, 166—(and Thomas MCCRAE) *The Principles and Practice of Medicine*, rev., 822
Osteomalacia treated by oöphorectomy (J. B. Hellier), 587. (O)
O'SULLIVAN, W. J.: Facial erysipelas, 299
Oto-laryngology, specialists in, 711, 769
Otology, review of books on, 209
Ovary, chorion-epithelioma of (Miles H. Phillips), 938—(J. Chisholm), 938
OWEN, Harold Edward, obituary notice of, 921
Ox serum, normal, in treatment of anthrax (leading article), 865
Oxford Ophthalmological Congress: Annual meeting, 164—Perimetric methods (Luther C. Peter), 164—Doyne Memorial Lecture (F. Richardson Cross), 165—Papers and demonstrations, 165—Dinner, 165
OXLEY, W. H. F. (and J. DUNDAS): Case of gonorrhoeal mastitis, 744
Oxygen inflation of the peritoneal cavity for radiographic purposes (J. E. H. Roberts), 742. (O)
Oyster's consolation, 262

P.

PACKER, Lieut.-Col. H. Dixon, C.I.E. conferred upon, 260
PADDLE, James Isaac, obituary notice of, 225
PADDOCK, Chas. E.: *Maternitas*, rev., 941
Paisley, typhus at, 680
Palermo hospitals closed owing to their inability to pay their staff, 647
PALFREY: Micro-organism of typhus, 557
PALMER, F. W. Morton: Dislocation of humerus by muscular action, 126
Paracentesis abdominis, 686
Paraffin wax bath, the melted (F. Howard Humphris), 397
Paralysis, infantile. *See* Poliomyelitis
Paralysis, left recurrent laryngeal, in mitral stenosis, 946
Paralysis involving ankle-joint treated by tendon transplantation (John Fraser), 320
Paralysis caused by nerve injury, diagnosis and treatment of (H. S. Souttar), 387—(Noel H. M. Burke), 388—(Cecil Worster-Drought), 389—Discussion, 390
Paraplegia, spastic, hereditary, 217
Paraplegia, spastic, hereditary, with ataxia and mental defect (J. S. Manson), 477
Parasitology, review of books on, 822
Paris: Influenza deaths in 1919, 417—International Anthropological Institute founded in, 630—Ear, nose, and throat instruction at the St. Joseph Hospital, 647—Conference on tuberculosis, 707, 911—M. Mourier succeeds M. Mesureur as chief of the Assistance Publique, 993
Paris. *See also* France
PARKER, Eric: *An Angler's Garland of Fields, Rivers, and other Country Contentments*, rev., 747
PARKER, G.: *The Early History of Surgery in Great Britain*, rev., 745

Parliament, Medical Notes in:
Air of Manchester, 182
Alcoholic strength measured in proof spirit, 27
Anthrax, death from in Southwark, 137
Army, British: R.A.M.C. resignations, 714—Officers, 796
Army Council constitution, 290
Army huts for housing, 92
Artificial limbs, 27, 137, 291, 913, 986—Supply of, 137—For demobilized officer who cannot provide for his own support, 291—Service pensioners to choose any limb on the approved list, 913—New, 986
Asylums, public, and responsibility of friends *re* removal of pauper patients, 913
Austrian children, hospitality to, 291
Autumn session, 640
Births registered in England and Wales in the first quarter of 1920, 27
Births registered in Scotland, 64
Black Sea hospital ships, 137
Blind Persons Bill, 291
Carcasses, exposure of, 182
Casualties in Russia, 137
Census Bill, 254, 760
Census (Ireland) Bill, 254
Central Liquor Control Board. *See* Liquor
Chemists and druggists, registration of, 796
Civil Liabilities Department, 182
Colonial medical services, 92, 254, 290—Report, 254, 290
Concurrent treatment and training, 834, 913
Coroners' inquests, 949
Coroners' (borough) remuneration, 913
Cost of living, 677
Criminal Law Amendment Bills, 64, 182, 219, 759, 949
Dangerous Drugs Bill, 181, 219, 913
Deaths, uncertified, inquests, 949
Dentists Bill, 220, 677, 714, 913, 949, 986
Dentures for ex-service men, 219
Deputy Commissioners of Medical Services, 913
Disabled ex-service postmen, 182
Disabled men's outlook, 137
Disablement, total, definition of, 92. *See also* Pensions
Divisional medical officers, 796
Drugs and dressings in India, 291
Epidemics in London, 834
Excess profits duty, concession as to charitable gifts, 136
Experiments on animals, 220
Ex-service men: In asylums, 26, 796, 913—Receiving Poor Law relief, 677—Concurrent treatment and training, 834, 913—Treatment of, 986
Finance Bill: Charitable contributions allowance, 219
Food, condemned, at Newcastle-on-Tyne, 291
Food Control Committees to be superseded by local organizations, 64
Foodstuffs, total consumption in United Kingdom, 182
General Nursing Council, 92
HEALTH MINISTRY:
  Milk, condensed, standardization of, 291
  (Miscellaneous Provisions) Bill, 290, 331, 676, 713, 757, 795, 833, 868, 911, 947, 986—Probable abandonment of financial clauses, 795—Hospitals clause, 833—Incipient mental disorder homes, 868—Voluntary hospitals, 868—Statement by Dr. Addison: Committee on finance, 869—Rejected by the Lords, 947—To be reintroduced next session, 986
  Work of, review of first year, 134
Hospital staffs, pensions department, 913
Hospital, 3rd London General, Wandsworth, 136, 291
Hospitals abroad, 913
Hospitals for pensioners, 92
Hospitals, provision of by county councils, 331
Hospitals, State control of, 291
Hospitals, voluntary: Financial position of, 26, 136, 676, 713, 757—Dr. Addison's address to the House of Commons Medical Committee, 676
House rent increase, 27
Housing, army huts for, 92
Hunger strikers, 27
Imperial medical service, 291
Income tax: Of residents abroad, 92—Definition of charity for, 182—Women doctors and, 182
Indian Medical Service, future of, 92
Indian Medical Service Pensions, 26, 254
Inebriates in Scotland, 137
INSURANCE, NATIONAL:
  Approved societies' valuation, 291
  Cost of, 92
  Cost of working, 182
  Expenditure, 714
  Medical record cards, cost of, 796
  Referee consultants, 181
  Remuneration of insurance practitioners in London, 949
  Sanatorium benefit, 949
  Sanatorium benefit staffs, 714
  Sickness insurance, 92
Lead Poisoning (Women and Children) Bill, 291
League of Nations health organization, 291, 332

Parliament, Medical Notes in (*contd.*):
Lincoln friendly societies' dispensaries, 92
Liquor Control Board, Central, 949
Living, cost of, 677
Local Government officers' superannuation, 714
London Hospital, position of, 834
London medical schools, grants to, 912
London University: Site, 137, 253, 290, 714, 796—Bloomsbury site, 796—New buildings, 796
Lunacy certificates, 869
Maternity and child welfare, 714, 796
Medical appeal boards, an attack on, 181
Medical examination of women claimants for pensions, 63
Medical examinations, latest statistics, 254
Medical officers, appointment of, 986
Medical officers in Mesopotamia and Persia, 913
Medical treatment during demobilization furlough, 219
Medical Services, Deputy Commissioners of, 913
Medical use of spirits, 63
Mesopotamia: Health of troops in, 182—Casualties, 796—Medical officers in 913
Metropolitan Asylums Board accounts, 913
Milk, condensed, standardization of, 796
Milk and Dairies Bill, 913
Milk imported from Denmark 182
Milk licences, number granted, 92
Ministry of Health Bill. *See* Health Ministry
Miscellaneous Provisions Bill. *See* Health Ministry
Missing officers and men, approximate number of, 92
Motor spirit duty revenue, 26
Motor vehicles, speed limits for, 92
Mount Pleasant Hospital, Chepstow, 92
National Health. *See* Insurance
National Registration Acts, 182
Naval officers, grants for peace time uniforms, 92
Neurasthenics: In Manchester, 182—Provision for in Ireland, 182
Nursing staff of prison hospitals, 220
Officers' dependants' allowance, 64
Parliamentary session, 289
Part-time pension medical officers, 26
Patent medicines. *See* Proprietary medicines
Pauper lunatics in workhouses, 291
Peace Treaty, 714
PENSIONS:
  Army officers' 20 per cent. allowance on, 64
  For the blind, 26
  Disabled men employed by Ministry, 92
  Ex-service men in asylums, 26
  Hospital staffs, 913
  Indian Medical Service, 26, 254
  Medical examination of women claimants 63
  Part-time pension medical officers, 26
  Treatment of mental ex-service cases, 986. *See also* Pensions Ministry
Persia, medical officers in, 913
Poor Law hospitals and infirmaries, 834
Poor Law institutions, empty beds in, 913
Poor Law patients, cost of, 137
Poor Law statistics, 219
Port sanitary authorities, Treasury grants to, 182
Prison Medical Service, 291
Prisoners, sick, 332
Proprietary Medicines Bill, 180, 217, 251, 676, 796, 949—Lords' amendments in Committee, 251
Public Health (Tuberculosis) Bill, 760, 796, 913. *See also* Tuberculosis
R.A.M.C. resignations, 714—Officers, 796. *See also* Army, British
Rabies and the Muzzling Order, 64
Rats, destruction of, 220
Registration Acts, National, 182
Remuneration of insurance practitioners in London, 949
Salaries at criminal lunatic asylum, Dundrum, co. Dublin, 291
Sanatorium benefit, 949
Sanatorium benefit staffs, 714
Sexual Offences Bill, 64
Shell Shock Committee, 713
Slum area conditions, 92
Small-pox in Glasgow, 64, 92, 136, 181, 949—In Scotland, 949
Smoke and noxious vapours in Sheffield, 986
Spirits, imported potable, 291
Spirits, medical use of, 63—Modification of existing restrictions, 714
Suicide statistics, 677
Temporary Provisions Bill, 913
Tetanus in war, 92
Tuberculosis, administrative changes, 986
Tuberculosis Bill, 760, 796, 913
Tuberculosis in Leicestershire, 291
Tuberculosis officers' fees, 986
Uncertified deaths. *See* Deaths
University Grants Committee, 913
War, end of, 714. *See also* Peace

Parliament and public health (Lieut.-Col. F. E. Fremantle), 677
Parsley infusion in treatment of gall stones (H. Cameron Kidd), 244—Correspondence on, 293, 338, 414, 498

PARSONS, A. R.: Diagnosis of nervous disorders of stomach and intestine, 508
PARSONS, J. Herbert: Theory of vision, 673—Elected President of the Illuminating Engineering Society, 993
PARSONS, T. R.: Acidosis in disease, 73
PASKE, Deputy Surgeon-General Charles Thomas, obituary notice of, 456
PASLEY, Captain Claud John Burgoyne, obituary notice of, 496
Pasteur Institute, Shillong: Report, 608
Pasteur Institute founded at Manáos, Brazil, 630
Patent Medicines Bill. *See* Proprietary medicines
PATERSON, D. H. (and others): Acute rheumatism in children, 858
PATERSON, Herbert J.: Surgical treatment of gastric ulcer, 105
PATERSON, Marcus: *The Shibboleths of Tuberculosis*, rev., 517—Tuberculous milk, 721
Pathology, animal and plant (leading article), 22
Pathology in the medical curriculum, relation of preliminary science teaching to (J. Lorrain Smith), 17
Paton's List of Schools and Tutors, rev., 705
Pauper lunatics. *See* Lunatics
Peace treaty (parliamentary question), 714. *See also* War, end of
PEACHEY, S. J., invents a new method of vulcanizing rubber, 31
PEAKE, Arthur W.: Professional secrecy, 141
PEARL, Raymond: The nation's food, a statistical study, 944
Pears' soap, 648
PEARSON, Sir Arthur: Blind masseurs, 768
PEARSON, Karl: A pure race, 328
PÉCHÈRE, V.: Venereal disease in women and children, 201
Peerage, Burke's, pamphlet on, 994
Peking, medical education in, 292
Pellagra, review of book on, 860
Pelvic floor, the female (Henry Briggs), 665
PEMBERTON, Ralph (and others): *Studies in Arthritis in the Army* [U.S.] *based on Four Hundred Cases*, 983
PENFIELD, Wilder Graves, elected to a Beit Fellowship, 942
PENNA, J. (and others): *El Tratamiento del Carbunclo Humano Con el Suero Normal de Bovino*, 865
Pension medical officers, part-time (parliamentary question), 26
Pensioners, artificial limbs for, 225. *See also* Artificial
Pensioners, hospital treatment for, 989
Pensioners, hospitals for (parliamentary question), 92

PENSIONS MINISTRY:
Administration: Committee of inquiry (parliamentary question), 869
Appeal tribunal, 677
Appeals from tribunals, 760
Appeals, statistics, 714
Appointments, 261
Artificial limbs, new, 956
Artificial limbs, regional directors appointed, 646
Artificial limbs, standardized, 225. *See also* Artificial limbs
Concurrent treatment and training, 913
Consultants appointed, 79
County Asylum, Prestwich, Manchester, and ex-service men, 875
Director-General of Medical Services, new address, 417
Disablement pensions, reduction of, 182, 262, 986—Adjustment of, 714, 986
Ex-service men employed by, 92
Ex-service men receiving Poor Law relief, 677
Eye, loss of, 31
Hospital treatment for pensioners, 989
Medical appeal boards, attack on, 181
Mental ex-service cases, treatment of, 986
Officers and nurses who have completed a course of sanatorium treatment to be granted retired pay whilst undergoing a further course, 927
Parliamentary questions, 92, 181, 182, 254, 677, 714, 869, 913, 986
Reassessment of pensions, 714, 986
Service and disability, 182
Special Grants Committee, 142
Staff of, 92
Treatment allowances, 714
Tuberculous ex-service men, 31

Pentosuria, essential, seven cases of (P. J. Cammidge and H. A. H. Howard), 777. (O)
People's League of Health, the King becomes patron of, 261
Peptone, intravenous (leading article), 328—Correspondence on, 840, 871. *See also* Protein *and* Epilepsy
PERCIVAL, Archibald Stanley: Early symptoms of nervous disorder, 697
Perinephric abscess. *See* Abscess
Peripheral nerves. *See* Nerves
Peritoneal cavity, oxygen inflation of for radiographic purposes (J. E. H. Roberts), 742. (O)
Peritoneum, free gas in, and subsequent subcutaneous emphysema (H. G. G. Nelson), 280
Persia, medical service in (parliamentary question), 913
Petrograd doctors, plight of, 180
Petrol licence refunds, 648
Petrol, price of on the Continent, 494, 531
PETTIFOR, W. H.: Electrical aids for the deaf, 897
Pharmacology, some recent advances in (leading article), 131
Pharmacopœia, the Extra, rev., 78
PHILLIPS, Miles H.: Chorion epithelioma of the ovary, 938
PHILLIPS, P. G.: Occupation in the treatment of neurasthenia, 994
Phthisis. *See* Tuberculosis
Physical Therapeutic Centre: Experiment by the North Staffordshire coal and iron masters along the suggested lines of future medical service (T. Lister Llewellyn), 434—Leading article on, 445
Physical therapeutics (J. Stuart Ross), 937—Discussion on, 938
Physically defective children, joint conference on, 837
"Physician and friend" or "herbalist," 98
Physics, Institute of, begins work, 845
Physics in medical education (Sir E. Rutherford), 16
Physiological Reviews, a new American publication, 771
Physiology and medicine, relation of (Thomas Lewis), 459. (O)—(Leading article), 483—Note on, 525
Physiology teaching of, 525
PICTON, Lionel Jas.: Open ether without chill, 69. (O)—Report on housing, 602
PIERCE, Bedford: Dementia praecox, 474—Early symptoms of nervous disorder, 697
PIGEON, Captain John Walter, killed in action, obituary notice of, 496
Pin removed from larynx by an improvised method (L. N. Harding), 399
Pioneer in American naval medicine (W. P. C. Barton), 90
Pipette for automatic measurement of constant volumes, 480
PIRQUET, C. VON (and E. MAYERHOFER): *Lehrbuch der Volksernährung nach dem Pirquetschen System*, rev., 665
PITISCUS, Bartholomaeus, said to be the inventor of the decimal point, 497
Pituitary extract in obstetrics, 146
Placenta ablata treated by pituitrin with obstetric anaesthesia (J. Lind Smith), 936
Placenta praevia, Caesarean section in: laparotomy for ruptured uterus (Sir John Byers), 202. (O)
Placenta praevia with vasa praevia, delivered by Caesarean section (Dr. McNair), 665
Plague: At Liverpool, 31—In Java, 419, 845—In Egypt, 771—In India, 871
Plague, cholera, and yellow fever, incidence of (leading article), 943
Plague and rats, 66
PLARR, Victor C.: Poetry of the microcosm, 898
Plastic surgery, review of books on, 245
PLATT, Harry: Treatment of fractures, 453
Pleural reflex (W. F. Castle), 936
Pleural reflex syncope, 26, 224, 255, 333, 455
Plumbers' Company, antiquity of, 771
Plumbism. *See* Lead poisoning
Pneumonia, lobar, case of accompanied by acute appendicitis (L. Firman-Edwards), 477
POCKLEY, Antill: Diagnosis of glaucoma, 111
Poetry of the microcosm, 898
Poisoning by arsine (M. Bannister), 476. (O)
Poisoning by small doses of aspirin, 300, 418
Poisoning by bromoform: recovery (William B. Watson), 702—(F. W. Burton-Fanning), 783
Poisoning, cadmium, and plumbism, 530
Poisoning, carbon tetrachloride, 497
Poisoning by food, outbreak at Brixton, 286
Poisoning from stem of hemlock used as a pea-shooter, 231
Poisoning with hydrochloric acid: recovery (Howard Stratford), 164
Poisoning, Lead (Women and Children) Bill, 291
Poisons, capillary, shock and anaphylaxis (leading article), 791
Poisonous weed killers, Pharmaceutical Society's suggestions, 821
Poland, typhus in, 407, 447
Police, Metropolitan, annual report, 490
Police surgeons' fees. *See* Fees
Poliomyelitis, anterior, place of muscle re-education in treatment of (Charles Mackay), 513. (O)—Correspondence on, 682, 768, 841, 918, 953
POLITZER, Adam, obituary notice of, 297—Leaves his valuable otological library to the University of Vienna, 417
Polycythaemia rubra [Ayerza's disease], secondary forms of (F. Parkes Weber), 658. (O). *See also* Ayerza's disease
PONDER, C. W.: The meningococcus "carrier" question, 427
Poor Law hospitals and infirmaries (parliamentary question), 834
Poor Law infirmary. *See* Infirmary
Poor Law institutions: Diet in, 712—Empty beds in (parliamentary question), 913—Discharged soldiers or sailors suffering from loss of memory in (parliamentary question), 913
Poor Law patients, cost of (parliamentary question), 137
Poor Law salaries. *See* Salaries
Poor Law statistics (parliamentary question), 219
POPE, Lieut.-Col. Thomas Henry, obituary notice of, 956
Population of the world, increase of, 675. *See also* Birth rate
Port sanitary administration, 255
Port sanitary authorities, Treasury grants to (parliamentary question), 182
PORTEOUS, James Lindsay H. H., obituary notice of, 30
PORTER, Charles: *Sanitary Law in Question and Answer*, rev., 246
Post-graduate school and the Board of Education (leading article), 483—Letter from George E. MacLean, 492
Post-graduate specialization (leading article), 177
Post-graduate work: In London, 89, 863—At Newcastle, 221—At Paris University, 251—At St. Andrews, 408—At St. Joseph Hospital, Paris, 647—In Victoria, 765
Post-graduation study, information concerning, 367
Postmen, disabled ex-service (parliamentary question), 182
Posture in defaecation. *See* Defaecation
Potassium chlorate tablets cause death of a boy who ate about thirty, 231
POTTENGER, F. M.: *Symptoms of Visceral Disease*, rev., 861
POTTS, W. A.: Dementia praecox, 475—Psychotherapy, 626
POULTON, E. P.: Acidosis in disease, 72, 190—A correction, 190—Subacute bacterial endocarditis, 310
POWER, Sir D'Arcy: The Vicary Lecture, 751
POWER, Major Pierce: Idiosyncrasy to novarsenobillon, 976
POYNTON, F. John: Subacute bacterial endocarditis, 306—(and others): Acute rheumatism in children, 858—The study of heart disease, 882. (O)
Practices, advertisements of, 258, 338
Pregnancy, effect of upon the size and weight of some of the organs of the body (P. T. Herring), 886. (O)
Pregnancy after ligature of Fallopian tubes (Arthur Crook), 244—(A. Norman McArthur), 890
Pregnancy and latent syphilis (R. A. Hendry), 783
Pregnancy and pulmonary tuberculosis, 287
Pregnancy, toxaemias of, diastase content of urine in (R. L. Mackenzie Wallis), 273 (O)
Pregnancy, toxaemias of, sodium bicarbonate tolerance in (Clifford White), 976
Preliminary science in the medical curriculum. *See* Medical curriculum
Prescription sign, 830
Presentations, 31, 90, 221, 299, 571, 613, 725, 771, 799, 805, 845, 866
Presidential address (leading article), 22
Press, the public, and the public health (leading article), 864
Prevention in domestic practice (leading article), 709
Preventive medicine. *See* Medicine
PRICE, G. Basil (and others): *Dysentery, Trench Fever, Gas Poisoning, etc., in relation to Disabled Ex-service Officers and Men*, rev., 553
PRICE, J. Dodds: Antimony in kala-azar, 453
PRIDEAUX, Dr.: Psychotherapy, 626
Primary health centres. *See* Health
Prince of Wales in Australia, 603
PRINTER, Captain Mervanji Dinshaw, obituary notice of, 956
Prison hospitals, nursing staff of (parliamentary question), 220
Prison medical service (parliamentary question), 291—Information concerning, 377
Prisoners, sick (parliamentary question), 332
PRITCHARD, Eric: Vitamines in clinical medicine, 159—Tuberculous milk, 801
Professional classes, fertility of (leading article), 672. *See also* Birth rate
Professional Classes War Relief Council, 31, 685
Professional secrecy (leading article), 59—Correspondence on, 141
Prolapsus uteri. *See* Uterus, prolapse of
Proprietary Medicines Bill, 180, 214, 217, 251, 676, 796, 949—Leading article on, 214—Lords' amendments in Committee, 251
Protein therapy, intravenous, in epilepsy (F. H. Edgeworth) 780. (O)—Correspondence on, 840, 871. *See also* Peptone
Protein therapy, intravenous, in puerperal septicaemia, 268
PROVIS, F. L.: Treatment of uterine fibroids, 540
Prussia, deaths from tuberculosis in, 845
Psoriasis, treatment of, 806
Psychiatric Research, German Institute of, 47
Psychic secretion, its relation to digestion (E. P. Cathcart), 893
Psychological analysis (W. H. B. Stoddart), 322—Discussion, 322—Correspondence on, 410
Psychological medicine, information concerning the study of, 371
Psychology of anaesthesia (Dudley Buxton), 859

Psychopathology and dissociation (William Brown), 847 (O), 951—Correspondence on, 918, 951. *See also* Hypnotism
Psychc-pharmacology, 216
Psychoses, intestinal pathology in, 132
Psychotherapy (T. A. Ross), 619—(Aldren Turner), 622—(A. F. Hurst), 623—(Bernard Hart), 623—(H. Crichton Miller), 624—(Tom A. Williams), 624—(William Brown), 625—Discussion, 625
Public gardens, 846
Public health authorities and habitual drunkenness, 458
Public Health (Tuberculosis) Bill, 760. *See also* Tuberculosis Bill
Public health, 1919-20, annual report of Chief Medical Officer, Ministry of Health, 675, 706, 709
Public health in Egypt in 1918, 572
Public health and the public press (leading article), 864
Public Health Council, Irish: Withdrawal of State grants for Irish health service, 527—Grants for voluntary hospitals, 527—Grants, 606—Meeting of medical delegates, 678—Report of Council, 678—Withholding of public health grants, 679—Medical attendance on Royal Irish Constabulary, 679—Amalgamation of Irish medical organizations, 679—Fees for medical examination for life insurance, 679—Irish National Health Insurance Commission, 679—Other business, 679
Public health, review of books on, 246
Public health salaries, 94, 142, 224. *See also* Salaries
Public health services, information concerning, 371
Public posts, unsuccessful applications for, 924, 994
Public press and the public health (leading article), 864
Public services, information concerning, 373—Handbook on, 634
Public and tuberculosis, 985
Pudenda, ulcerating granuloma of. *See* Granuloma
Puerperal sepsis (Victor Bonney), 263—(Beckwith Whitehouse), 267—(A. E. Gow), 268—(H. Leith Murray), 269—Discussion, 271—(Herbert Williamson), 273—Correspondence on, 412, 418, 452, 493, 530, 802
Pulmonary oedema. *See* Oedema
Pulses, radial, disappearance of during deep inspiration (W. Edgecombe), 890—Correspondence on, 958, 994
Pure race (Karl Pearson), 328
Purple Island of Phineas Fletcher, 898
Purpura (Dr. Stallybrass), 893—(Cecil Williams), 979
PYE-SMITH, R. J.: Appreciation of Sinclair White, 415
Pyloric hypertrophy, congenital (leading article), 636

Q.

Queensland, North, the white man in, 526
QUINE, Wm. J. Aitken: Cottage hospital organization, 190
Quinine and its related alkaloids in pharmacology and therapeutics (W. E. Dixon), 113—(W. Ramsden), 117—(Major H. W. Acton), 117—(Sir Archibald E. Garrod), 120—(T. S. Hele), 120—(Lieut.-Col. Sir Leonard Rogers), 120—(M. Nierenstein), 120—(J. C. McWalter), 120—(C. M. Wenyon), 120—Discussion, 121

R.

Rabbit-shot in appendix (D. Leigh Spence), 319
Rabies and the muzzling order (parliamentary question), 64—Cases in Holland, 145—Cases in England, 755
Race, a pure (Karl Pearson), 328
Radial pulse. *See* Pulse
RADICE, Sheila: *The New Children*, rev., 747
Radiological institute, need for a, 832
Radiologist, place of in medicine (Alfred Ernest Barclay), 385
Radiology in gynaecological practice (Cuthbert Lockyer), 539
Radiology. *See also X* rays
Radium bromide, effects of exposure to (W. S. Lazarus-Barlow), 664
Radium treatment of carcinoma, two cases alive after eight years (Echlin S. Molyneux), 548. (O)
Radius, outward dislocation of the head of (W. Drew Mitchell), 399
RADLEY, Sidney B.: A large urethral calculus, 593
RAMOS: Forgotten compresses in the bladder, 487
RAMSDEN, W.: Quinine in pharmacology and therapeutics, 117
RAINY, Harry (and Robert HUTCHISON): *Clinical Methods: A Guide to the Practical Study of Medicine*, rev., 518
RAMSAY, A. Maitland: *Clinical Ophthalmology for the General Practitioner*, rev., 632
Ramsgate insurance practitioner acquitted of a charge to defraud, 875
RANO, S.: Sero-therapy of tuberculosis, 792
RAPER, H. S.: Preliminary science in the medical curriculum, 74
Rats, destruction of (parliamentary question), 220
Rats and plague, 66
RAWLINS, Morna: Venereal disease in women, 194
RAYLEIGH, Lord, awarded Rumford medal of Royal Society, 867
Raynaud's disease of fingers, warming apparatus for, 571
RAYNER, H.: The oyster's consolation, 262
RAYNER, Henry: Homes for treatment of incipient insanity, 918
RAYNER, H. H.: Treatment of fractures, 411
READ, C. Stanford: Dementia praecox, 474
Reconstruction therapy, review of books on, 282
Recruit, the teeth in (Major J. P. Helliwell), 968
Rectum, diseases of, review of book on, 980
Red Crescent, development of in Turkey, 279
Red Cross emblem, War Office and the use of, 804
Red Cross gifts for London hospitals, 184
Red Cross League, International, meeting of Medical Board, 90
Red Cross and the League of Nations, 639, 685, 725
Red Cross Societies, League of, compiles list of children sent to Ural Mountains from Moscow and Petrograd, 703
Red Cross Society, British: Grant to Sheffield Royal Infirmary, 719—Home ambulance service, 866
Red Cross Society in India, 292
REES, Ferdinand: Medical profession and co-operation, 146
REGARD, G. L.: *Chapitres choisis de chirurgie*, rev., 667
Regimental medical officer, his powers and duties (Colonel R. J. Blackham and Captain T. H. Blake), 971
Registrar-General: Annual report, 79, 211; for Scotland, 950
Registrar-General's weekly returns, 725—Quarterly returns, 805. *See also* Vital statistics
Registration Acts, National (parliamentary question), 182
REICHEL, Sir Henry: The university in Wales, 642
REID, A Christie: Miner's nystagmus, 917
Renal outlines, diagnostic value of (S. Gilbert Scott), 395
RENDLE, Dr: Lip reading, 533
Rents Restriction Act, 86, 247—*Tenants' Emergency Charter (Houses, Shops, etc.) under the Rent Restriction Act, 1920*, rev., 247
Research Defence Society. *See* Society
Research and the general practitioner, 261
Resuscitation in death under anaesthesia. *See* Anaesthesia
Retractors, glass, for cerebral surgery, 941

Reviews of Books:

Acari, Studies on, No. 1, The Genus Demodex, Owen (Stanley Hirst), 400
Air Sickness, its Nature and Treatment (René Cruchet and René Moulinier), 401
American Pediatric Society Transactions, vol. xxxi, 247
Anaesthesia: L'Anaesthésie Locale et Régionale en Oto-Rhino-Laryngologie (Georges Canuyt and J. Rozier), 517
Anaesthesia: L'Anaesthésie Locale en Ophthalmologie (Dr. Duverger), 518
Anaesthetics, Modern (J. F. W. Silk), 440
Anatomy of the Limbs of the Horse, Topographical (O. Charnock Bradley), 596
Anatomy, Cunningham's Manual of Practical (revised and edited by A. Robinson), 479
Anatomy, Descriptive and Applied, 21st edition (Henry Gray), 634
Anatomy as seen in the Hand, Principles of (Frederic Wood Jones), 281
Anatomy, Surface (Charles R. Whittaker), 480
Angler's Garland of Fields, Rivers, and other Country Contentments (Eric Parker), 747
Animal Experiments and Surgery (Walter G. Spencer), 209
Annals of Medical History, 1919, vol. ii, Nos. 2 and 3 (Osler Number), 166
Annual Charities Register and Digest, 824
Antigens: Les Antigènes et les Anticorps: Caractères général, applications diagnostiques applications thérapeutiques (M. Nicolle), 941
Arterio-sclerosis and Hypertension (Louis M. Warfield), 479
Arterio-venous Fistula, Study of (Curle L. Callandar), 324
Athena: A Yearbook of the Learned World (edited by C. A. Ealand), 634
Backwaters of Lethe (G. A. H. Barton), 440
Bacteriology: Atlas und Grundriss der Bakteriologie und Lehrbuch der Speziellen Bakteriologischen Diagnostik (K. B. Lehmann and R. O. Neumann), 788
Beauty and the Beast: An Essay in Evolutionary Aesthetic (Stewart A. McDowall), 168
Biological Society of Barcelona: Treballs de la Societat de Biologia, 400
Blood and Urine Chemistry, the Newer Methods of (R. B. H. Gradwohl and A. J. Blaivas), 746
Bose, Sir Jagadis: Life and Works of (Patrick Geddes), 441
Brightness and Dullness in Children (Herbert Woodrow), 323
Burdett's Hospitals and Charities (1920), 941
Captain-Jewels (Charles J. Whitby), 705
Cardiac Examination, Synoptic chart of (John D. Comrie), 862
Centenary Volume of Charles Griffin and Co., Ltd., 788
Charities Register and Digest, Annual, 824
Chemistry, Intermediate Textbook of (Alexander Smith), 283
Chemistry, Practical, including Simple Volumetric Analysis [and Toxicology], P. A. Ellis Richards), 596
Child, School, Welfare of (Joseph Cates), 518
Child Welfare Movement (J. E. Lane-Claypon), 246
Children, the New (Sheila Radice), 747
Children's Diseases, Lectures on (Robert Hutchison) 896
Clinical Methods: A Guide to the Practical Study of Medicine (R. Hutchison and Harry Rainy), 518
Cocoa and Chocolate: Their History from Plantation to Consumer (Arthur W. Knapp), 519
Colloids in Biology and Medicine (H. Bechhold), 210
Corner-stone of Reconstruction, 168
Constitution for the Socialist Commonwealth of Great Britain (Sidney and Beatrice Webb), 478
Crises (Maurice Level, translated by Alys Eyre Macklin), 747
Cunningham's Manual of Practical Anatomy (edited by A. Robinson), 479
Cytology, Introduction to the Study of (L. Doncaster), 745
Development of the Human Body: A Manual of Embryology (J. Playfair McMurrich), 981
Diary of a Police Surgeon (Lieut.-Col. Graham Grant), 210
Dictionary for Nurses, Baillière's Complete Medical (edited by Constance M. Douthwaite), 441
Dictionary, Pocket Medical (George M. Gould), 981
Diphtheria, Circulatory Failure of (Esther Harding), 282
Doctors' Income Tax, 824
Dunlop Book: The Motorist's Guide, Counsellor, and Friend, 897
Duodenal Tube and its Possibilities (Max Einhorn), 704
Ear Diseases: A Textbook for Practitioners and Students of Medicine (Edward Bradford Dench), 209
Electric Ionization (A. R. Friel), 596
Electro-diagnosis and Therapeutics, Atlas for (F. M. de Laroquette), 668
Electro-therapy, its Rationale and Indications (J. Curtis Webb), 668
Embryology, Human: Development of the Human Body (J. Playfair McMurrich), 981
Embryology, Laboratory Outline of, with special reference to the Chick and the Pig (F. R. Lillie and C. R. Moore), 324
Encephalitis, Epidemic [Encephalitis Lethargica] (Frederick Tilney and Hubert S. Howe), 705
Epileptic Children, Care of Sane (J. Taylor Fox), 167
Extra Pharmacopoeia (W. H. Martindale and W. W. Westcott), 78
Eye Diseases (M. Stephen Mayou), 705
Eye Diseases: Grundriss der Augenheilkunde für Studierende und praktische Aerzte (A. Brückner and W. Meisner), 596
Eye. *See also* Ophthalmology
Feeble-mindedness in Children of School Age (C. Paget Lapage), 861
Food Inspection and Analysis (Albert E. Leach), 980
Food and Meat Inspection (William Robertson), 980
Food Supplies in Peace and War (Sir R. Henry Rew), 897
Fractures, Compound Fractures, Dislocations, and their Treatment (John A. C. Macewen), 861
Fractures: Annales de la Clinique Chirurgicale du Professeur Pierre Delbet. No. 7, Les Fractures du Col des Fémur (Antoine Basset), 939
Gas Poisoning of War, Collected Studies on the Pathology of (Major Milton C. Winternitz), 594
Genito-urinary Organs and Kidney, Diseases of (Robert Holmes Greene and Harlow Brooks), 633
Genito-urinary Surgery and Venereal Diseases, White and Martin's (E. Martin, B. A. Thomas, and S. W. Moorhead), 897
Greek Science and Modern Science (Charles Singer), 550

Reviews of Books (*continued*):
Griffin Centenary Volume, 788
Harrow Life of Henry Montague Butler, D.D. (Edward Graham), 789
Heart Beat, Mechanism and Graphic Registration of (T. Lewis), 166
Histology, Essentials of, Descriptive and Practical (Sir E. A. Schafer), 282
Home Exercises for Spinal Curvatures (Richard Timberg), 282
Horse, Topographical Anatomy of the Limbs of (O. Charnock Bradley), 596
Hospital Letter-writer in France (May Bradford), 634
Housing and Town Planning in England and Wales, the Law Relating to, 246
How to Conduct a Meeting, Standing Orders and Rules of Debate, 788
Immortal Caravel (Arthur Lynch), 941
Immunity: Traité de l'Immunité dans les maladies infectieuses (Jules Bordet), 167
Index of Symptoms, with Diagnostic Methods (Ralph Winnington Leftwich), 981
Income Tax for 1920-21, Rates, Relief, Repayment, 824
Income Tax, Doctors', 824
Income Tax Guide, 1920 (*Financial Times*), 824
Income Tax and Super Tax (1842-1921), 402
Industrial Clinic: A Handbook Dealing with Health in Work (edited by E. L. Collis), 128
Infectious Diseases: A Practical Textbook (Claude Buchanan Ker), 518
Influence of Man on Animal Life in Scotland: A Study in Faunal Evolution (J. Ritchie), 518
Johns Hopkins Hospital Reports: Study of Arterio-venous Fistula with an Analysis of 447 Cases (Curle L. Callandar), 324
Kala-azar and its Treatment (Upendranath Brahmachari), 324
Kidney, Common Infections of, with the Colon Bacillus and Allied Bacteria (Frank Kidd), 400
Link between the Practitioner and the Laboratory (Cavendish Fletcher and Hugh McLean), 788
Liver and Pancreas Diseases: Foie et Pancréas (J. Castaigne, M. Brulé, N. Fiessinger, H. Garban, and G. Faroy), 550
Liver Wounds: Les Blessures du Foie et des Voies Biliaires (P. Soubeyran), 940
Malaria at Home and Abroad (Lieut.-Col. S. P. James), 631
Mammary Apparatus of the Mammalia in the Light of Ontogenesis and Phylogenesis (E. Bresslau), 283
Man, Influence of, on Animal Life in Scotland (J. Ritchie), 518
Massage, its Principles and Practice (James B. Mennell), 824
Materia Medica, Pharmacy, Pharmacology, and Therapeutics (Sir William Hale-White), 634
Materia Medica and Therapeutics, Treatise on, including Pharmacy, Dispensing, Pharmacology, and Administration of Drugs (Rakhaldas Ghosh), 210
Maternitas (Chas. E. Paddock), 941
Meat and Food Inspection (William Robertson), 980
Mediaeval Medicine (James J. Walsh), 324
Medical Dictionary. *See* Dictionary
Medical Directory (1921), 940
Medical Electricity (H. Lewis Jones), 940
Medical Jurisprudence, Taylor's Principles and Practice of, 860
Medical Jurisprudence and Toxicology, Textbook of (Rai Bahadur Jaising P. Modi), 550
Medicine: La Médecine (G. H. Roger), 401
Medicine, the Principles and Practice of (Sir William Osler and Thomas McCrae), 822
Medico-Tropical Practice: A Handbook for Medical Practitioners and Students (G. E. Brooke), 746
Mental Deficiency—Amentia (A. F. Tredgold), 549
Michelin Guide, 402
Midwifery, by Ten Teachers (edited by Comyns Berkeley, H. Russell Andrews, and J. S. Fairbairn), 787
Midwifery, Handbook of (Comyns Berkeley), 705
Midwifery, Introduction to (Archibald Donald), 595
Midwifery, Manual of (Thomas Watts Eden), 595
Midwifery, Notes on (J. M. Munro Kerr and James Hendry), 897
Mind and Work (Charles S. Myers), 896
Minor Operations, Practical Hints on (G. Percival Mills), 705
Mouth Hygiene, Everyday (Joseph Head), 247
Nerve Disease, Functional (edited by H. Crichton Miller), 439
Nerve Injuries: Les Lésions des Nerfs, Traitement et Restauration (Madame Athanasio-Benisty), 595
Nervous Diseases, Diagnosis of (Sir James Purves Stewart), 247
Neurological and Other Papers (John Michell Clarke), 440

Reviews of Books (*continued*):
Neurology: Les Maladies Nerveuses (A. van Gehuchten), 703
Neurology, Studies in (Henry Head, W. H. R. Rivers, Gordon Holmes, James Sherren, Theodore Thompson, and GeorgeRiddoch), 127
Neurology: Travaux Neurologiques de Guerre (Georges Guillain and J. A. Barré), 324
New Children (Sheila Radice), 747
Nightingale, Florence (Eleanor Frances Hall), 440
Nurses' Dictionary. *See* Dictionary
Nutrition: Lehrbuch der Volksernährung nach dem Pirquetschen System (C. von Pirquet and E. Mayerhofer and others), 666
Obstetric Practice, Difficulties and Emergencies of (Comyns Berkeley and Victor Bonney), 787
Obstetrics, Manual of (Edward P. Davis), 282
Obstetrics, Manual of (John Cooke Hirst), 282
Obstetrics, Normal and Operative (G. P Shears), 787
Obstetrics, Operations of (Frederick Elmer Leavitt), 595
Ophthalmic Operations, Manual of (F. P. Maynard), 705
Ophthalmic Practice, Manual of (F. P. Maynard), 705
Ophthalmological Society of the United Kingdom, Transactions, vol. xxxix, 247
Ophthalmology, Clinical, for the General Practitioner (A. Maitland Ramsay), 632
Ophthalmology, Practical Treatise on (L. Webster Fox), 595
Ophthalmology: Taschenbuch der Augenheilkunde für Aerzte und Studierende (Curt Adam), 595
Ophthalmology, Tropical (Lieut.-Col. Robert Henry Elliot), 516
Ophthalmology. *See also* Eye
Orthopaedics: Aus 25 Jahren Orthopädischer Arbeit (Oscar Vulpius), 128
Orthopaedics, Physical Reconstruction and (Captain Harry Eaton Stewart), 746
Painless Childbirth (C. Henry Davis), 668
Parasitology, Human (D. Rivas), 822
Parenthood, the Control of (edited by J. Marchant), 596
Paton's List of Schools and Tutors, 705
Pellagra (H. F. Harris), 860
Personal Beauty and Racial Betterment (Knight Dunlop), 788
Pharmacology (Douglas Cow), 480
Physical Fitness, Assessment of by Correlation of Vital Capacity and Certain Measurements of the Body (Georges Dreyer and George Fulford Hanson), 323
Physiology, Handbook of (W. D. Halliburton), 247
Plastic Surgery: Its Principles and Practice (John Staige Davis), 861
Plastic Surgery of the Face (H. D. Gillies), 245
Poems (John O. Tunstall), 168
Public Health Nursing, Organization of (Annie M. Brainard), 941
Public Services, Handbook on, 634
Radiology: Radiologie des vaisseaux de la base du coeur (H. Vacquez and E. Bordel), 896
Reconstruction Therapy (William Rush Dunton), 282
Rectum: Handbook of Diseases of the (Louis J. Hirschman), 980
Red Halls and other Verses (K. W. Monsarrat), 862
Rent Restriction Act, 247
Revels of Orsera: a Mediaeval Romance (Sir Ronald Ross), 479
Rheumatism and Arthritis (Ralph Stockman), 281
Roll of Honour of St. Thomas's Hospital, 128
Sanitary Law, Handbook of (B. Burnett Ham), 246
Sanitary Law in Question and Answer (Charles Porter), 246
Sanitation, Practical Tropical (E. P. Minett), 551
School Child, Welfare of (Joseph Cates), 518
Selected Lectures and Essays (Sir John Bland-Sutton), 77
Shibboleths of Tuberculosis (Marcus Paterson), 517
Skin Diseases (Richard L Sutton), 246
Socialist Commonwealth of Great Britain, Constitution for (Sidney and Beatrice Webb), 478
Somme, The, vol. i: The First Battle of the Somme, 551
Spinal Curvatures, Home Exercises for (Richard Timberg), 282
Springtime and other Essays (Sir Francis Darwin), 746
Sternberg, George Miller: a Biography (Martha L. Sternberg), 981
Street of Faces: Glimpses of Town (Charles Vince), 596
Sugar, Manufacture of from Cane and Beet (T. H. P. Heriot), 823
Surgery in Great Britain, Early History of (G. Parker), 745
Surgery: a Textbook by various Authors (edited by George E. Gask and Harold W. Wilson), 704

Reviews of Books (*continued*):
Syphilis: Étude Critique de l'Étiologie des Bronchites Chroniques avec Sclérose Pulmonaire (Jacques Dalsace), 669
Syphilis: a Treatise on Etiology, Pathology, Diagnosis, Prognosis, Prophylaxis, and Treatment (Henry H. Hazen), 594
Syphilis, Treatment of (H. S. Paketel), 940
Taylor's Principles and Practice of Medical Jurisprudence, 860
Tenants' Emergency Charter (Houses, Shops, etc.) under the Rent Restriction Act (1920), 247
Therapy: Handbuch der klinischen Hydro-, Balneo-, und Klimato-therapy (Alois Strasser, Franz Kisch, and E. Sommer), 441
Tropical Medicine, Essentials of (Walter E. Masters), 551
Tropical Sanitation, Practical (E. P. Minett), 551
Tuberculin: Lehrbuch der Spezifischen Diagnostik und Therapie der Tuberkulose (Drs. Bandelier and Roepke), 632
Tuberculosis (G. Norman Meachen), 824
Tuberculosis: Archivos Españoles de Tisiologica (Luis Saye), 128
Tuberculosis: L'infection bacillaire et la Tuberculose chez l'homme et chez les animaux (A. Calmette), 894
Tuberculosis and Public Health (H. Hyslop Thomson), 210
Tuberculosis, Pulmonary (Maurice Fishberg), 786
Tuberculosis, Shibboleths of (Marcus Paterson), 517
Tumours complicating Pregnancy, Labour and the Puerperium (Herbert R. Spencer), 787
Venereal Disease and its Prevention (R. Leblanc), 519
Venereal Diseases: Their Clinical Aspect and Treatment (J. E. R. McDonagh), 439
Visceral Disease, Symptoms of (F. M. Pottenger), 861
Vision Classes, Manual for Conservation of (Winifred Hathaway), 980
Vitalism and Scholasticism (Bertram C. A. Windle), 440
War Injuries: Chapitres de Chirurgie (G. L. Regard), 667
Warfare in the Human Body: Essays on Method, Malignity, and Allied Subjects (Morley Roberts), 632
What to Tell our Grown-up Sons about Women (by the Widowed Physician), 480
White and Martin's Genito-urinary Surgery and Venereal Diseases (E. Martin, B. A. Thomas, and S. W. Moorhead), 897
Woman of Forty (Edith B. Lowry), 518
X-Ray Atlas of the Systemic Arteries of the Body (H. C. Orrin), 895
Yearbook of Scientific and Learned Societies of Great Britain and Ireland, 79
Yearbook of the Universities of the Empire, 1918-1920 (edited by W. H. Dawson), 669
Zoology, Elementary, Manual of (L. A. Borradaile), 668
Zoology, Practical, Junior Course of (A. M. Marshall and C. H. Hurst), 669

REID, Sir R. Henry: *Food Supplies in Peace and War*, rev., 897
REYNOLDS, E. S.: Early symptoms in nervous disease, 695
Rheumatism, acute, in children (F. J. Poynton, D. H. Paterson, and J. C. Spence), 858—Discussion, 858
Rheumatism, review of books on, 281
Rheumatoid arthritis, climate in, 497, 572, 614
Rheumatoid arthritis treated by vaccines (H. Warren Crowe), 815. (O)
Rhinorrhoea, paroxysmal, and hay fever, method of treating (Morley Agar), 125. (O)
RHODES, James Herbert, obituary notice of, 297
RICE, David: Dementia praecox, 475
RICE-OXLEY, A. J., elected Mayor of Kensington, 771
RICHARDS, P. A. Ellis: *Practical Chemistry, including Simple Volumetric Analysis and Toxicology*, rev., 596
RICHARDSON, O. W., awarded Hughes medal of Royal Society, 867
RICHMOND, B. A., presentation to, 725
RICHMOND, D. S.: Obstetrical rarities, 686
Rickets, cases of, in an out-patient department (Helen M. M. Mackay), 929. (O)
Rickets, experimental (Professor Mellanby), 989
RIDDELL, Marian Scott, appointed Registrar of the General Nursing Council, 97
RIDDOCH, George (and others): *Studies in Neurology*, rev., 127—(and Henry Head) Sensory disturbances in the hand following injuries of the cerebral cortex, 782
RIDOUT, C. A. Scott: Risks after operation for tonsils and adenoids in outdoor clinics, 952
RIENHOFF, W. F.: Hereditary spastic paraplegia, 217
RIGBY, Walter, presentation to, 613
"Right to strike," 558, 609
Ringworm, treatment of (Robert Hughes), 164
RITCHIE, James: Preliminary science in the medical curriculum, 75—*The Influence of Man on Animal Life in Scotland: A Study in Faunal Evolution*, rev., 518—Disappearance of radical pulses during deep inspiration, 958

RITCHIE, John: Appreciation of Samuel Sloan, 683
RITCHIE, W. T.: Prognosis in heart affections, 126
RIVAS, D.: *Human Parasitology*, rev., 822
RIVERS, W. H. R. (and others): *Studies in Neurology*, rev., 127—Dementia praecox, 475
ROAF, H. E.: Relation of physiology to medicine, 462
ROBB, Gardner: Bacteriology of cerebro-spinal meningitis, 434
ROBERTS, David Lloyd, obituary notice of, 569—Estate and bequests of, 647
ROBERTS, Ff.: Treatment of denervated muscle, 242
ROBERTS: J. E. H.: Oxygen inflation of the peritoneal cavity for radiographic purposes, 742. (O)
ROBERTS, Morley: *Warfare in the Human Body: Essays on Method, Malignity, and Allied Subjects*, rev., 632
ROBERTSON, John: Housing, 213
ROBERTSON, J. W (and others): Studies on arthritis in the U.S. army, 983
ROBERTSON, William: *Meat and Food Inspection*, rev., 980
ROBINSON, A.: Edits *Cunningham's Anatomy*, 479—Delivers Sir John Struthers lecture on antenatal death, 985
ROBINSON, Beverley: Compound tinctures in treatment of malaria, 299
ROBINSON, Burton: "The sun cure" in the High Alps, dealing with pulmonary and surgical tuberculosis as treated at Leysin, 821
ROBINSON, W.: The future of service men in asylums, 893
ROCHE, Redmond: Acute ulcerative stomatitis caused by drugs, 498
Rockefeller Foundation, the work of, 446
Rocky Mountain spotted fever, 485
Rodrigues, history of leprosy in, 447
ROEPKE, Dr. (and Dr. BANDELIER): *Lehrbuch der Spezifischen Diagnostik und Therapie der Tuberkulose*, rev., 632
ROGER, G. H.: *La Médecine*, rev., 401
ROGERS, Lambert (and J. Strickland GOODALL): Blood pressure in Graves's disease, 588 (O)
ROGERS, Sir Leonard: Quinine in pharmacology and therapeutics, 120—*The Value of Experiments on Animals: Notes of Personal Experience*, 984
ROGET, F. F.: Health, the Red Cross, and the League of Nations, 639, 685, 725
Rôle, 300
ROLLESTON, Sir Humphry (and Stanley WYARD): Case of hepatic cirrhosis allied to Hanot's disease, 544. (O)
ROMANES, A. (and G. G. JOHNSTONE): Value of extensive inoculation of a community during an epidemic of typhoid fever, 932 (O)
RÖNTGEN, W. C., elected honorary member of Vienna Academy of Sciences, 260
ROPER, Mr.: Causes of iritis, 745
ROSE, F. G.: Filariasis in British Guiana, 937
ROSENFELD, Siegfried: Tuberculosis in Austria, 829
ROSS, J. Stuart: Physical therapeutics, 937
ROSS, S. J.: Circumcision, 32—Future provision of medical services, 228
ROSS, Sir Ronald: *The Revels of Orsera: A Mediaeval Romance*, rev., 479—Malignant malaria contracted in England, 871
ROSS, T. A.: Psychotherapy, 619
ROTH, Paul Bernard: Bonesetters *versus* the science and art of surgery, 300—Status of orthopaedic surgery, 921
Rotterdam, two cases of typhus at, 613
ROUTH, Amand: Venereal diseases in women and children, 197—A correction, 262—Puerperal sepsis, 271—Latent syphilis in pregnancy, 784
ROWBOTHAM, Stanley: Intratracheal anaesthesia by the nasal route for operations about mouth and lips, 590. (O)
ROWLANDS, R. P.: Surgical treatment of gastric ulcer, 107—Treatment of calculi impacted in pelvic portion of ureter, 163
Royal Air Force. *See* Air
Royal Army Medical Corps. *See* Army, British
Royal Earlswood Institution, report, 407, 458
Royal Faculty of Physicians and Surgeons, Glasgow: Information concerning the study of medicine, 351—Honorary Fellow admitted, 456, 612—Annual meeting, 770—Election of officers, 770—Finlayson memorial lecture (Sir William Leishman), 870—Admission of Fellows, 956
Royal Institute of Public Health Congress (Geneva, 1921), 826
Royal Navy. *See* Navy
Royal Sanitary Institute Congress:—Sir Robert Firth: Sanitary workers and preventive medicine, 212—G. A. Auden: Institutions for the mentally defective, 212—Edgar L. Collis: Industrial hygiene, 212—Lieut.-Col. F. E. Fremantle: Maternity and child welfare, 213—John Robertson: Housing, 213—H. Gordon Smith: After-care of the tuberculous, 213—Next meeting (Folkestone, 1921), 571
ROZIER, J. (and Georges CANUYT), *L'Anesthésie Locale et Régionale en Oto-Rhino-Laryngologie*, rev., 517
Rubber, synthetic, production of abandoned in Germany, 31
Rubber, new method of vulcanizing, 31
RUFFER, Sir Marc Armand: *Studies in Palaeopathology*, 523
RUSS, Charles: Mortality of venereal diseases, 187, 294, 493
RUSS, Sidney: Cancer research, 656
RUSSELL, Bedford: Anaesthesia in tonsil and adenoid operations, 413
Russia: Casualties in (parliamentary question), 137—Plight of Petrograd doctors, 180—Plight of South Russian doctors, 258—List of children sent to Ural Mountains from Moscow and Petrograd compiled by League of Red Cross Societies, 703
Russia, South, scientific medical work in, 641
Russian Hospital at Tel-el-Kebir, medical society formed at, 845
Rusty, on getting, 489, 534—Textbook as an index, 534
RUTHERFORD Andrew (and James MILLER): Atrophy of the liver, 581
RUTHERFORD, Sir E.: Preliminary science in the medical curriculum—physics, 16
RUTHERFORD, Thomas, appointed J.P. for county of Bute, 956
RYALL, Charles: Surgical treatment of gastric ulcer, 106—Surgical treatment of cancer of rectum, 739
RYALL, E. Canny: Treatment of calculi impacted in the pelvic portion of the ureter, 335
Rye grass. *See* Grass
RYLE, J. A.: Fractional method of gastric analysis, 979—Demonstration of Einhorn's tube with modifications, 979

S.

SADLER, F. J.: Treatment of chronic non-infectious disease by modern methods, 666
Sahara, blindness in, 647
SAINT, Charles F. M.: Surgery, good and bad, 649. (O)
ST. GEORGE, George, awarded jewel of the 32nd degree by the Freemasons, 227
St Kilda, epidemic of mumps in, 839
Salaries of Poor Law medical officers (Ireland), 139, 950
Salaries, public health, 94, 142
Salaries of Southampton medical officers, 28
Salary at Criminal Lunatic Asylum, Dundrum, co. Dublin, 291
SALOMON, H., awarded Government grant for successful vaccination, 922
Salvarsan, toxic effect of (report of committee), 945
SAMUELS, Lester: Treatment of gonorrhoea in women, 413
SAMWAYS, D. W.: Motoring in France, 806
SANARELLI, Professor, made a Roman Senator, 771
Sanatorium benefit (parliamentary question), 949
Sanatorium benefit staffs (parliamentary question), 714
Sanatorium treatment of tuberculosis, 216
Sanatorium for consumption, new for Liverpool, 490
ference, 603
SANDERS, Dr.: Dementia praecox, 475
SANDHURST, Viscount, retires from treasurership of St. Bartholomew's Hospital, 416
Sanitary workers and preventive medicine (Colonel Sir Robert Firth), 212
SARGENT, Percy: End-results of injuries to peripheral nerves treated by operation, 464—Glass retractors for cerebral surgery, 941
SAVAGE, W. G.: Cats and diphtheria, 406—Canned food, 602
SAVILL, Agnes: Treatment of uterine fibroids, 541
SAYE, LUIS: *Archivos Espanoles de Tisiologia*, rev., 128
SCALES, Shillington: Treatment of uterine fibroids, 541
SCHAFER, Sir Edward: *The Essentials of Histology, Descriptive and Practical*, rev., 282
SCHARLIEB, Mary, appointed J.P. for London, 144—*Vaccination*, rev., 831
SCHÖNFELDER: Umbilical diphtheria in the newborn, 911
School children: Consolidated regulations *re* special services of elementary education, 526
Schools and tutors, Paton's list of, 705
Science at Cambridge. *See* Cambridge
Science, history of, 550, 557
Science, history of, reprints of eighteenth century papers, 519
Science in the medical curriculum. *See* Medical
Science in medicine. *See* Medicine
Scientific and industrial research, report of committee, 525
Scientific medical work in South Russia, 641
Scientific relations with Germany, 529
Sclerosis, disseminated (James Taylor), 436
Scopolamine-morphine narcosis in childbirth (Alexander Orlebar), 860
SCRIPTURE, Edward W.: Inscriptions of speech, 783
Scotland:
Caledonian Medical Society, 221
Class fees in Scottish universities, 839
Consultative council, 798, 870
Edenhall Hospital for the limbless, 138
EDINBURGH:
Health of, 915
Honorary degrees, 93
One hundred years of gynaecology in, 839
New buildings of the University, 93
Royal Infirmary, 452, 643
Royal Maternity Hospital, 221
Small-pox in, 643
The University, 607, 839
University Lord Rectorship 452
Finlayson memorial lecture, 870
GLASGOW:
Anderson College, 409
Clinical school, a new, 680
Finlayson memorial lecture, 870
Health of, 915
Small-pox in, 93, 221, 409, 452, 607
Typhoid fever in, 409
Hospitals, future of, 799, 950
Inebriates in (parliamentary question), 137
Insanity, decrease in, 138
Mackie expedition to Central Africa, 915
Medical centenarian, death of (J. S. S. Logie), 138
Midwives in Scotland, 798
Payment of hospital staffs for State-aided patients, conference on, 643
Registrar-General's report, 950
St. Andrews, new principal, 950
St. Kilda, epidemic of mumps in, 839
Scottish Board of Health, 409, 567
Scottish Consultative Council, 798, 870, 950—Report, 950
Scottish Temperance Act, 528
Small-pox in Glasgow, 93, 221, 409, 452, 607, 949—In Scotland, 607, 799, 949—In Edinburgh, 643
Temperance Act, 528
Typhus fever in Scotland, 607—In Paisley, 680
Varicella, notification of, 567
Voluntary hospital principle. *See* Hospital
SCOTT, Dr.: Bacteriology of cerebro-spinal meningitis, 434
SCOTT, Noy: State and future of medical practice, 45
SCOTT, S. Gilbert: Diagnostic value of the renal outlines, 395—Treatment of uterine fibroids, 541
SCOTT, Waugh: Dietetic deficiency and endocrine activity, 238
Scottish Board of Health, 409—And applications from voluntary hospitals for grants in respect of duty-paid spirits or drugs, 456—Notification of varicella, 567
Scottish Consultative Council: Resignations and appointments, 798—Interim report, 870, 900, 950
Scottish Temperance Act, 528
Scurvy: Influence of overcooked vegetables in causing scurvy among children (Harriette Chick and Elsie J. Dalyell), 546. (O)
Seamen, venereal disease among, 146. *See also* Venereal
Seasickness, atropine in, 190
Seborrhoea, 497
Seborrhoea capitis, treatment of, 614
SELLERS, W. H. I.: Venereal disease in women and children, 197
SELLORS, T. Blanchard: Nervous and functional dyspepsia, 610
Sensory disturbances of hand. *See* Hand
SERGENT, Edmond: The louse as disease carrier, 923
SERLE, George Broadfoot, obituary notice of, 414
Sero-therapy of tuberculosis, 792
Serum, horse, therapeutics of normal, 952
Serum, ox, in treatment of anthrax (leading article), 865
Serum treatment of cerebro-spinal fever (T. G. M. Hine), 426
Serums and vaccines in treatment of puerperal infection (H. Leith Murray), 269
SERVICE, R. McC.: Medical resettlement, 296
Service men, future of in asylums (W. Robinson), 893. *See also* Asylums
Sexual Offences Bill (parliamentary question), 64
SHAROOD, Deputy Inspector General Edward J., awarded a Greenwich Hospital pension, 874
SHARPE, W. Salisbury: The eye and mouth in sleep, 529
SHEARS, G. P.: *Obstetrics, Normal and Operative*, rev., 787
Sheffield, relief for the shortage of hospital beds in, 93—Smoke and noxious vapours in (parliamentary question), 986
Shell Shock Committee, 408—(Parliamentary question), 713
"Shell shock." *See* Neuroses, traumatic
SHEPHERD, Major Arthur, obituary notice of, 770
SHERREN, James (and others): *Studies in Neurology*, rev., 127
SHERRINGTON, C. S.: Cavendish lecture on postural activity of muscle, 288—Huxley lecture on the gateways of sense, 875
SHERWOOD, E. Grace: Acidosis in disease, 73
Shillong, report of Pasteur Institute at, 608

SHINGLETON-SMITH, Lionel, obituary notice of, 415
Shock, capillary poisons, and anaphylaxis (leading article), 791
SHORE, L. E.: Operative treatment of peripheral nerve injuries, 469
SHORT, Rendle: Causation of appendicitis, 979
Sick prisoners. *See* Prisoners
Sick wastage in war, 601
Sight, review of books on, 980
Silesia, Upper: Outbreaks of small-pox, typhus, and typhoid due to Polish invasion, 845
SILK, J. F. W.: *Modern Anaesthetics*, rev., 440
Silver nitrate in treatment of hay fever and paroxysmal rhinorrhoea (Morley Agar), 125. (O)
SIMPSON, G. C. E.: Treatment of anthrax, 821
SIMPSON, W. J., a correction, 146
SINGER, Charles: *Greek Science and Modern Science*, rev., 551—Francis Adams, 673
Sinuses, nasal accessory, inflammatory lesions of (Herbert Tilley), 962
Sinuses, urinary (P. McRitchie), 516
Site planning, common sense in, 602. *See also* Housing
SKELLY, Captain Charles A., obituary notice of, 456
SKERRETT, Frank B.: Eye and mouth in sleep, 611
Skin apposition without superficial sutures (Frank Hathaway), 280. (O)
Skin eruptions and internal infections, 498
SKINNER, Dr.: Treatment of glycosuria and diabetes, 786
SLADDEN, A. F.: Death after tonsillectomy, 438, 569, 721
Sleep, the eye and mouth in, 529, 611
SLOAN, Samuel, obituary notice of, 683, 723
Slum area conditions (parliamentary question), 92
Small-pox: In Glasgow, 93, 221, 409, 452, 497, 607, 949; (parliamentary questions), 64, 92, 136, 181, 949—Precautions against in London, 184—In Scotland, 607, 799, 949—In Edinburgh, 643—In Upper Silesia, 845
Small-pox carriers, vaccinal condition of, 28, 95, 186, 258, 336
SMILEY, G. K., presentation to, 571
SMITH, A. Lapthorn: Puerperal sepsis, 272—Cancer and heredity, 296—Treatment of inoperable cancer, 645
SMITH, Alexander: *Intermediate Textbook of Chemistry*, rev., 283
SMITH, G. Elliot: Scope and equipment of an anatomical institute, 67. (O)
SMITH, H. Gordon: After-care of the tuberculous, 213
SMITH, J. B., re-elected Mayor of Hertford, 771
SMITH, J. Lind: Placenta ablata treated by pituitrin with obstetric anaesthesia, 936
SMITH, J. Lorrain: Relation of the preliminary science teaching to pathology in the medical curriculum, 17—Address as President of Section of Pathology and Bacteriology, 419, 581
SMITH, May, and William MCDOUGALL): Alcohol, fatigue, and mental activity, 710
SMITH, R. Eccles: Poisoning by 2½ grains of aspirin, 300—Head of rye grass in lung removed from pleura, 701. (O)—Cereal ears as foreign bodies, 846
SMITH, T. F. Hugh: Can one work with intracapsular fracture of femur? 455
Smith's Medical Visiting List, 994
SMITHELLS, Arthur: Preliminary science in the medical curriculum—chemistry, 19
SMITH-WYNNE, Surgeon-General William Arnold, obituary notice of, 144
Smoke, domestic, report of Departmental Committee, 220
Smoke and noxious vapours in Sheffield (parliamentary question), 986
Sneezing and cough, paroxysmal, 98
Soap, Pears', 648
Social hygiene academies to be established at Breslau, Charlottenburg, and Düsseldorf, 666
Société d'Orthopédie, next annual meeting, 805
Societies, Federation of Medical and Allied: Conference *re* maintenance of hospitals by local authorities, 762
Society, Abernethian: — B. H. Spilsbury: Medical investigation of crimes of violence, 910
Society, American Pediatric, *Transactions*, rev., 247
Society, Anatomical, of Great Britain and Ireland: Summer meeting at Cambridge, 62
Society, Brighton and Sussex Medico-Chirurgical: — Alexander Orlebar: Scopolamine-morphine narcosis in childbirth, 860
Society, Bristol Medico-Chirurgical: — Carey Coombs: Patency of the ductus arteriosus, 979—Rendle Short: Causation of appendicitis, 979—Cecil Williams: Case of periodic jaundice, 979; case of purpura haemorrhagica, 979
Society, Caledonian Medical: Annual meeting, 221
Society, Cardiff Medical: Exhibition of cases, 860
Society, Chelsea Clinical: Inaugural dinner of twenty-fourth session, 805
Society, Edinburgh Medical Missionary, note on the work of, 832
Society, Edinburgh Medico-Chirurgical: — Claude B. Ker: Herpes and chicken-pox, 126 W. T. Ritchie: Prognosis in heart affections, 126 — H. M. Traquair: Myopia, 126 — A. Goodall: Blackwater fever, 126—F. M. Caird: Tuberculous stricture of intestine, 820—Chalmers Watson: Bacteriuria, 820—J. M. Graham: Blood transfusion, 820—J. Stuart Ross: Physical therapeutics, 937—Discussion on, 938
Society, Edinburgh Obstetrical: Election of officers, 839—One hundred years of gynaecology in Edinburgh (William Fordyce), 839
Society, German Dermatological: Appoints a committee to investigate the abortive treatment of syphilis, 647—First meeting since the war to be held in 1921, 719
Society, Glasgow Royal Medico-Chirurgical: — W. K. Hunter: The basal ganglia, 631—Leonard Findlay: Lethargic encephalitis in children, 820—E. P. Cathcart: Psychic secretion, its relation to digestion, 893
Society, Harveian: Discussion on the future of the Poor Law infirmary, 987
Society, Hunterian: Clinical meeting, 979—J. A. Ryle: Fractional method of gastric analysis, 979; Demonstration of Einhorn's tube and his own modification thereof, 979—Alan H. Todd: Splints and appliances made in the orthopaedic workshops of Guy's Hospital, 979
Society, Illuminating Engineering: Election of president, 993
Society, International, of Surgery, meets in Paris, 132
Society, Italian, for Advancement of Science, 311
Society, Italian, of Orthopaedics, 685
Society, Italian Paediatric: Election of officers, 957—Next congress, 957
Society, the Johnson: Sir Norman Moore elected president, 496
Society, Leeds University Medical: — T. Wardrop Griffith: Medicine at the University of Leeds, 670
Society, Leeds and West Riding Medico-Chirurgical: President's address, 666—Exhibition of cases and specimens, 666
Society, Liverpool Literary and Philosophical: — Sir James Barr: Immanuel Kant, 685
Society, London and Counties Medical Protection: Increase in amount of indemnity, 31
Society, Manchester Medical: Papers and exhibition of cases, 631—Joint meeting with the Liverpool Medical Institution, 892—Thelwall, Thomas: Hour-glass stomach, 892—Hill, Abram: Excess of normal cerebro-spinal fluid, 892—K. S. Monsarrat: Is cholecystectomy the normal operation in cholecystitis? 892—Thurstan Holland: Hour-glass stomach from the *x*-ray point of view, 893—Alan McDougall: Diagnosis of fits from the point of view of treatment, 979
Society, Manchester Pathological: Laboratory meeting and demonstration of specimens, 939
Society, Medical, of London: — Programme for next session, 526—Sir W. Hale-White's presidential address on medicine at the end of the eighteenth century, 598—F. J. Poynton, D. H. Paterson, and J. C. Spence: Acute rheumatism in children, 858—Discussion, 858—Sir Berkeley Moynihan: Malignant disease of the colon, 890—Discussion, 891
Society, Medical, in Mesopotamia, 639
Society of Medical Officers of Health: Annual meeting, 677—President's address on Parliament and public health, 677—Annual dinner, 677—Annual meeting of School Medical Group, 678
Society, medical, formed in Russian hospital at Tel-el-Kebir, 845
Society, Medical Sickness, Annuity, and Life Assurance: General meeting, 416
Society, Medico-Legal: — President's address: Medicine and the law (Lord Justice Atkin), 747—Note on above address, 946
Society, Newcastle-upon-Tyne and Northern Counties Medical: December meeting, 922—Address by Sir W. Macewen, 922—Annual dinner, 922
Society, North of England Obstetrical and Gynaecological: — F. Hamilton Lacey: After-results of colporrhaphy performed in 470 cases of genital prolapse, 821—Miles H. Phillips and J. Chisholm: Chorion-epithelioma of ovary, 938
Society, Nottingham Medico-Chirurgical: First meeting of session, 745—H. C. Cameron: Children in general practice, 745—Dr. Blurton: "The report of the Consultative Council and our attitude towards it." 821—J. C. Buckley: Address on syphilis, 979
Society, Ophthalmological, of the United Kingdom: *Transactions*, rev., 247
Society, Pathological, of Great Britain and Ireland: Joint meeting with Section of Pathology and Bacteriology, 57
Society, Pathological, of Manchester: Annual meeting, 666—Exhibition of cases and specimens, 666
Society, Pharmaceutical, of Great Britain: Subdivided qualifying examination, 379—Suggest appointment of a committee to inquire into law relating to prescribing and dispensing of medicines and supply and use of poisonous weed killers, 821
Society, Research Defence: Quarterly report, 249—Issues various pamphlets of interest, 805, 831, 984—And the Jenner Society, 831
Society, Röntgen: — Robert Knox: Need for a radiological institute, 832
Society, the Royal: Presidency of, 754—C. H. Kellaway: Effect of certain dietary deficiencies on the adrenals, 867—Presentation of medals, 867—Election of officers, 867—Anniversary dinner, 867
SOCIETY, ROYAL, OF MEDICINE:
Triennial gold medal instituted, 647
Sir Almroth Wright: Conditions of medical research, 797
Section of Anaesthetics — W. Dudley Buxton: Psychology of anaesthesia, 859
Section of the History of Medicine. — Charles Singer: Francis Adams a great general practitioner, 673
Section of Laryngology. — Annual summer congress, 25
Section of Obstetrics and Gynaecology. — Gordon Ley: Pathology of accidental haemorrhage, 165—Dr. Barris: Primary carcinoma of Fallopian tube, 165—Henry Briggs: Spoon-shaped depressed fracture of right frontal bone treated by elevation, 665; The female pelvic floor, 665—Dr. McNair: Placenta praevia with vasa praevia delivered by Caesarean section, 665—J. M. Munro Kerr: Surgery of uterus bicornis unicollis, 665—R. A. Hendry: Inter-relationship between pregnancy and syphilis, 783—Discussion, 784—Clifford White: Sodium bicarbonate in the toxaemias of pregnancy, 976—James Young and D. A. Miller: Etiology of eclampsia and the pre-eclamptic state, 976—Major C. A. F. Hingston: High blood pressure in eclampsia, 977
Section of Pathology. — W. S. Lazarus-Barlow: Some pathological effects of exposure to the gamma rays of 5 grams of radium bromide, 664
Section of Tropical Medicine. — J. B. Christopherson: Technique of intravenous injection of tartar emetic in bilharziasis, 937—F. G. Rose: Filariasis in British Guiana, 937
Urological Section. — Sir Thomas Horder: Treatment of subacute nephritis by kidney decapsulation, 727, 744—Discussion on, 744
War Section. — Martin Flack: Medical requirements for air navigation, 593
Society, Royal Statistical, opens a register of persons eligible for statistical posts, 145
Society, Royal, of Tropical Medicine: Annual subscription to be raised, 647
Society, School Dentists': Increase of subscription, 189
Society, Sheffield Medico-Chirurgical: — F. J. Sadler: Treatment of chronic non-infectious diseases, 666—Arthur Hall: Prognosis and treatment of glycosuria and diabetes, 785—G. Wilkinson: Modern theories of hearing, 859—Professor Mellanby: Experimental rickets, 989—Sheffield's new chair of pharmacology, 989
Society, South-Western Ophthalmological: Inaugural meeting, 745—Exhibition of cases, 745—Mr. Roper: Causes of iritis, 745
Society of Surgery, International, elects Sir William Macewen as next President, 408
Society of Trained Masseuses and Institute of Massage and Medical Gymnastics, amalgamation of, 408
Society, Ulster Medical: Opening meeting, 764—Election of President, 764
Society, Venereal Disease Prevention: Deputation to Minister of Health, 80—Letter containing plain statement of facts, 873
Society, Vocal Therapy: Second anniversary meeting, 771—Sir Frederick Mott: Influence of music on body and mind, 771
Society, West London Medico-Chirurgical: Conversazione and presentation of gold medal, 31—F. J. McCann: Prevention of female sterility, 665—H. A. Des Vœux: Blepsopathia or eyestrain, 938
Sodium bicarbonate, tolerance of in toxaemias of pregnancy (Clifford White), 976
Sodium, acetyl-p-aminophenyl stibiate of, in human trypanosomiasis and kala-azar (Philip Manson-Babr), 235—Discussion, 236
Sodium antimony tartrate, superiority of to emetine in bilharzia, 890
Sodium biborate in treatment of epilepsy in an asylum (John McCartney), 548. (O)
Sodium dimethylarsenate in treatment of inoperable cancer, 645
Soldier students, 333
Soldiers and sailors discharged and suffering from loss of memory in pauper lunatic asylums (parliamentary question), 913
SOLOMONS, Bethel: Syphilis insontium, 77—Obstetrical belt, 211
SOLTAU, A. Bertram (and others): *Dysentery, Trench Fever, Gas Poisoning, etc., in Relation to Disabled Ex-service Officers and Men*, 553—Sick wastage in war, 601
Some principles and an experiment (leading article), 87
Somerset, longevity in, 146, 262
SOMMER, E. (and others): *Handbuch der klinischen Hydro-, Balneo-, und Klimatotherapie*, rev., 441

SOUBEYRAN, P.: *Les Blessures du Foie et des voies biliaires*, rev., 940
South Africa for tuberculous patient, 533—Medical congress at Durban, 790
Southampton medical salaries, 28
SOUTTAR, H. S.: Place of electricity in diagnosis and treatment of nerve injuries, 387
Spain, new journal of dermatology and syphilis, *Archivos Dermosifiliograficos y Revista practica de la especialidad*, founded in, 279
SPALLANZANI, Lazare: *Observations et Expériences faites sur les Animalcules des Infusions*, rev., 519
SPEARMAN, Dr.: *Filaria bancrofti* and elephantiasis, 234
Speech, inscriptions of (Edward W. Scripture), 783
Spelman appeal, 98
SPENCE, Dr. Leigh: Rabbit-shot in appendix, 319
SPENCE, J. C. (and others): Acute rheumatism in children, 858
SPENCER, Herbert R.: *Tumours Complicating Pregnancy, Labour, and the Puerperium*, rev., 787
SPENCER, Walter G.: *Animal Experiments and Surgery*, rev., 209
SPILSBURY, Bernard H.: Atrophy of liver, 583—Medical investigation of crimes of violence, 910
Spinal meningeal tumour. *See* Tumour
Spirits: Medical use of (parliamentary question), 63, 714—Imported potable (parliamentary question), 291—Methylated (parliamentary question), 714
Spiroptera cancer. *See* Cancer
Spleen, primary tuberculosis of, 408
Splints, demonstration on (Alan H. Todd), 979
Spotted fever, Rocky Mountain, 485
Sprue, meat diet in (Philip Conran), 206. (O)—Correspondence on, 293
St. Leonards-on-Sea, two deaths from effects of barium carbonate administered in error, 296
Staffordshire, North, physical therapeutic centre in, 434
STALLYBRASS, Dr.: Purpura, 893
Stammering children, education of, 133
STAMMERS, A. D.: Fat-content in oils, 919
STARK, A. Campbell: Puerperal sepsis, 412, 493
STARLING, H. J.: Subacute bacterial endocarditis, 308
Starvation oedema. *See* Oedema
Stasis and the prevention of cancer (A. C. Jordan), 959 (O)
State and medical practice. *See* Medical
Statistical journal, a new (*Metron*), 712
STEELE, R.: Police surgeons' fees, 494
STEPHENS, G. Arbour: Dilatation of heart, 223, 417—Cadmium poisoning and plumbism, 530—Death after tonsillectomy, 611
STEPHENS, J. W. W. (and Warrington YORKE): Problems of filariasis, 231
Sterility in women, prevention of (F. J. McCann), 665
STERNBERG, Martha L.: *George Miller Sternberg: A Biography*, rev., 981
Stethoscope, an adjustable, 941
STEVENS, Charles H., case of, 795
STEVENS, W. G., presentation to, 725
STEWART, B. H.: Intrauterine diagnosis of congenital heart disease, 819
STEWART, F. H.: Incidence of worm infection in Indian troops of the Egyptian Expeditionary Force 592—Life-history of *Ascaris lumbricoides*, 818. (O)
STEWART, Grainger: Early symptoms in nervous disease, 696
STEWART, Captain Harry Eaton: *Physical Reconstruction and Orthopaedics*, rev., 746
STEWART, Sir James Purves: *Diagnosis of Nervous Diseases*, rev., 247
STEWART, M. J.: Atrophy of liver, 584
STILL, Geo. F.: Vitamines in clinical medicine, 155
STOCKER, W. W.: Voluntary hospitals and Poor Law infirmaries, 989
STOCKMAN, Ralph: *Rheumatism and Arthritis*, rev., 281
STODDART, W. H. B.: Psychological analysis, 322
STOKES, W. A.: "The right to strike," 609
Stomach, hour-glass (Thelwall Thomas), 892
Stomach, hour-glass, from the *x*-ray point of view (Thurstan Holland), 893
Stomach, malignant disease of, inflammable gas as a product of fermentation in (W. H. Stirling Armstrong), 477
Stomach and intestine, diagnosis of nervous disorders of (Arthur F. Hurst), 499—(T. Izod Bennett), 503—(Thomas R. Brown), 503—(W. Langdon Brown), 504—(H. Tyrrell Gray), 505—(R. J. M. Buchanan), 506—Discussion, 507
Stomatitis, acute ulcerative, caused by drugs (Hubert C. Bristowe), 399—Correspondence on, 498
STONEY, Florence: *X*-ray diagnosis of tumours of thorax, 395—Treatment of uterine fibroids, 541
STRACHAN, F. J.: Traumatic obstruction of duodenum, operation, recovery, 592
STRASSER, Alois (and others): *Handbuch der klinischen Hydro-, Balneo-, und Klimatotherapie*, rev., 441
STRATFORD, Howard: Poisoning with hydrochloric acid, recovery, 164
STRETTON, Samuel, obituary notice of, 844—Memorial to, 957
STUART, J. A. E., presentation to, 771
Students, soldier, 333
STURGE, Henry H.: Mortality of venereal diseases, 223
STURM F. Pearce: Specialists in oto-laryngology, 769—Theories of hearing, 919
Suffocation by collar of a nightshirt, 288
Suffolk, West, dinner to medical men who had served in the forces, 804
Sugar, review of book on, 823
Suggestion and hypnotism, 918, 951. *See also* Psychopathology
Suicide statistics (parliamentary question), 677
"Sun cure" in tuberculosis as treated at Leysin (Burton Robinson), 821
Surgery, good and bad (Charles F. M. Saint), 649. (O)
Surgery, review of books on, 704, 745, 861, 897
SUTHERLAND, Lieut.-Col. W. D., obituary notice of, 189
SUTTON, C. R. A.: Obstetrical rarities, 772
SUTTON, Harvey: Children and the slums in Australia, 492
SUTTON, Richard L.: *Diseases of the Skin*, rev., 246
SWAN, R. H. Jocelyn: Surgical treatment of cancer of rectum, 740
Sweden: Swedish Association of Medical Sciences established at Stockholm, 145
SWEETNAM, Deputy Inspector-General James Long, obituary notice of, 770
Sydney. *See* New South Wales *and* Australia
SYMONDS, Sir Charters: Appreciation of Sir Frederick Taylor, 954
Syncope, pleural reflex, 26, 224, 333
Syphilis (J. C. Buckley), 979
Syphilis, abortive treatment of, investigations on, 647
Syphilis, congenital (Edmund Hughes), 978
Syphilis in infancy and childhood, treatment of (Leonard Findlay), 197—Discussion, 201
Syphilis insontium (Bethel Solomons), 77
Syphilis, latent, in pregnancy (R. A. Hendry), 783
Syphilis and lupus. *See* Lupus
Syphilis, maternal, and foetal mortality, 134
Syphilis, review of books on, 594, 669, 940
Syphilis. *See* Venereal disease
Syphilitic virus, strains of (leading article), 521
Syringes, ampoule, 942

T.

Taenia voided by the mouth, 32
Talipes equino-varus, congenital, correction of (R. C. Elmslie), 320
Tanks, war, medical aspects of, 909
TANSLEY, A. G.: Preliminary science in the medical curriculum, 76
Tartar emetic and its toxicity, 498. *See also* Antimony
Tartrate of antimony. *See* Antimony
Tasmania, medico-political matters in, 81
Tattoo marks, obliterating, 685
TAYLOR, Sir Frederick, death of, 911—Obituary notice of, 954
TAYLOR, James: Neurological jottings, II, 436. (O)
TAYLOR, Captain J. S.: The founders of naval hygiene, 710
TAYLOR, Kathleen: Combined throat irrigator and spatula, 168
Taylor's Principles and Practice of Medical Jurisprudence, seventh edition, revised by F. J. Smith, rev., 860
Teeth cleaning, leaflet of instructions for, 488
Teeth, comparative anatomy of (Tomes bequest to Museum of Royal College of Surgeons), 25
Teeth in the recruit (Major J. P. Helliwell), 968
Tel-el-Kebir, medical society formed at the Russian Hospital, 845
Telephone charges, proposed, 225
Telephone exchange, the "Langham," 832
Telephone, inventor of the, 908
Temperance Act, Scottish, 528
Temporary Provisions Bill, 913. *See also* Liquor trade control
Tendon transplantation in treament of paralysis involving ankle-joint (John Fraser), 320
Tennis elbow, 190, 228, 261, 306, 534
Teratological experiments, Nature's (leading article), 828
Tetanus bacillus, the omnipresent (death of an infant), 985
Tetanus with general spasm cured with serum (J. W. Evans), 857
Tetanus in home hospitals (Sir David Bruce), 486
Tetanus in war (parliamentary question), 92
Textbook as an index, 534. *See also* Rusty
Theatres and music halls: insanitary condition of staff accommodation, 379
Thermometers: test proves 54 per cent. inaccurate in New York, 97
THOMAS, B. A. (and others): *White and Martin's Genito-urinary Surgery and Venereal Diseases*, rev., 897
THOMAS, J. E., re-elected Mayor of Bangor, 771
THOMAS, J. Lewis: Obstructed mucous secretion, 857
THOMAS, Thelwall: Hour-glass stomach, 892
THOMAS, William Edmund, appointed J.P. for Glamorgan, 416
THOMPSON, Edward: Royal College of Surgeons in Ireland, 141
THOMPSON, Theodore (and others): *Studies in Neurology*, rev., 127—Early symptoms in nervous disease, 695
THOMSON, H. Hyslop: *Tuberculosis and Public Health*, rev., 210
THOMPSON, John: Congenital pyloric hypertrophy, 636
THOMSON, Sir StClair: Appreciation of Adam Politzer, 297—Price of petrol on the Continent, 494
THORBURN, Sir William: End-results of injuries to the peripheral nerves treated by operation, 462
THORNTON, F. B., appointed Regional Medical Officer to Ministry of Health 771
Three generations of house-surgeons, 924
Throat irrigator and spatula combined, 168
Thyroid grafting (leading article), 248
Thyroiditis, acute, following erysipelas (L. M. Weeks), 476. (O)
TILLEY, Herbert: Inflammatory lesions of the nasal accessory sinuses, 962
TILNEY, Frederick (and Hubert S. HOWE): *Epidemic Encephalitis (Encephalitis lethargica)*, rev., 705
TIMBERG, Richard: *Home Exercises for Spinal Curvatures*, rev., 282
Tinnitus aurium, 726
Tobacco tremor, 228, 300
TODD: Micro-organism of typhus, 557
TODD, Alan H.: Demonstration on splints, 979
TODD-WHITE, Arthur T.: Primary health centres, 842—Gloucestershire scheme for extension of medical services, 952
Toe, the great, fractures of sesamoids of, 408
TOLDT, Carl, death of, 957
Tomes bequest to Royal College of Surgeons, 25
TOMKINSON, J. Goodwin: *X*-ray therapy in "oriental sore," 397
TOMPKINS, Edna H. (and others): Studies on arthritis in the United States army, 983
Tongue, chronic neuralgia of, with persistent gingivitis, 993
Tonsil and adenoid operations, anaesthesia in (Courtenay Yorke), 318. (O)—Correspondence on, 413, 455
Tonsil and adenoid operations in outdoor clinics, risk of (E. Watson-Williams), 887. (O)—Correspondence on, 951, 990
Tonsillectomy, death after (A. F. Sladden), 438, 569, 721—Correspondence on, 569, 611, 645, 721
TRAQUAIR, H. M.: Myopia, 126
TRAYLEN, C. L.: Future provision of medical services, 29—Consultative Council's report, 803
Treatment allowances (parliamentary question), 714. *See also* Pensions Ministry
TREDGOLD, A. F.: *Mental Deficiency (Amentia)*, rev., 549
Triorchid, 498
Tropical Association, Far Eastern, next meeting, Batavia (1921), 647
Tropical Australia, colonization of, 763
Tropical Diseases Bulletin, sanitation number, 771
Tropical fleas. *See* Fleas
Tropical medicine and animal experiment, 984
Tropical Medicine, Bombay School of, proposed, 957
Tropical medicine, information concerning the study of, 370
Tropical Medicine, Liverpool School of: *Historical Record (1898-1920)*, 183—Opening of Sir Alfred Jones Laboratory, 184—A correction, 228—Information concerning the study of medicine, 370
Tropical Medicine, London School of: Degrees and pass lists, 187—Information concerning the study of medicine, 370—Opening of new building in Endsleigh Gardens, 789
Tropical Medicine, Townsville Institute, Queensland: Resignation of Dr. Breinl, 145—Proposed experimental stations, 145, 379—Report for 1919, 526
Tropical medicine, review of books on, 551, 746
TROTTER, Thomas, 710
Trypanosomiasis, human, treated by intravenous injections of acetyl-p aminophenyl stibiate of sodium (Philip Manson-Bahr), 235—Discussion, 236
TUBB-THOMAS, J., obituary notice of, 612
Tubercle bacilli, absence of from dried milk, 876
Tuberculin, review of books on, 632
Tuberculosis (leading article), 906
Tuberculosis, administrative changes (parliamentary question), 986
Tuberculosis Bill, 760, 796, 838, 913—London County Council and, 838. *See also* Public health
Tuberculosis, campaign against: Correspondence on, 295—In Finland, 145—In Kent, 490—In Wales, 137, 763, 793—In Belfast, 764—In Austria (leading article), 829—In Birmingham, 886—In Guernsey, 920
Tuberculosis, calcium treatment of, 187, 256

Tuberculosis conference in Liverpool, 217, 603
Tuberculosis deaths in Prussia, 845
Tuberculosis, domiciliary risks of, 330
Tuberculosis, International Union against, conference in Paris, 707, 911
Tuberculosis in Lancashire 870
Tuberculosis in Leicestershire (parliamentary question), 291
Tuberculosis officers' fees (parliamentary question), 986
Tuberculosis Prevention, National Association for: British Medical Association delegates to the conference of, 526—Annual meeting, 558
Tuberculosis and the public, 985
Tuberculosis, pulmonary, and pregnancy, 287
Tuberculosis, review of books on, 517, 786, 894
Tuberculosis, sanatoriums for. *See* Sanatorium
Tuberculosis scheme, the Welsh, 137, 763
Tuberculosis schemes, practical difficulties in carrying out, 603
Tuberculosis, sero-therapy of, 792
Tuberculosis of spleen, primary, 408
Tuberculosis, surgical, treatment of at Liverpool Children's Hospital, Leasowe, 137
Tuberculosis services in London, 251
Tuberculosis, "sun cure" in, as treated at Leysin (Burton Robinson), 821
Tuberculosis treatment, discussion on, 603
Tuberculosis, after-care of (H. Gordon Smith), 213
Tuberculous ex-service men, 31
Tuberculous milk. *See* Milk
Tuberculous stricture of intestine (F. M. Caird), 820
"Tubunic" ampoule syringes, 942
TULLOCH, William John: Bacteriology of cerebro-spinal meningitis, 432
Tumour, cerebellar (R. T. Williamson), 591. (O)
Tumour, intestinal, two cases, operation, recovery (W. Balgarnie), 629 (O)
Tumour, spinal meningeal, diagnosis of (R. T. Williamson), 275. (O)
Tumours, malignant, coexisting, primary, 488
Tumours of thorax. *x* rays in diagnosis of (Robert Knox), 392—Discussion, 395
Tunis, blindness in, 647
TUNSTALL, John O.: *Poems*, rev., 168
Turkey, development of the Red Crescent in, 279
TURNER, Aldren: Psychotherapy, 622
TURNER, E. B: State and future of the medical profession, 46—Venereal disease in women and children, 201
TURNER, G Grey: Treatment of calculi impacted in pelvic portion of ureter, 163—Surgical treatment of cancer of rectum, 734
TURRELL, W. J: Treatment of denervated muscle, 241—Paralysis caused by nerve injury, 390
TWEEDY, E. Hastings: Recent progress in obstetrics, 892
Twilight sleep. *See* Labour, painless
TWINING, Daniel O.: Rupture of vagina during coitus, 418
Typhoid fever. *See* Fever, enteric
Typhus fever. *See* Fever
TYSON, W. T.: Diagnosis of nervous disorders ofstomach and intestine, 507

U.

Ulcer, gastric, perforation of, with extra-peritoneal escape of contents (John A. C. Macewen), 630
Ulcer, gastric, surgical treatment of (Sir Berkeley Moynihan), 99—(Charles H. Mayo), 103—(Herbert J. Paterson), 105—(A. H. Burgess), 106—(Charles Ryall), 106—(Brigadier-General John Finney), 107—(William Billington), 107—(R. P. Rowlands), 107—(Sir George Makins), 108—Discussion, 108
Ulcer, trophic, healing of, in the great toe of an aged glycosuric patient (H. Cecil Barlow), 124. (O)
Ulcerating granuloma. *See* Granuloma
Umbilical diphtheria. *See* Diphtheria
Uncertified deaths. *See* Deaths
Unemployment benefit and medical certificates, 898. *See also* Insurance
Unified medical service. *See* Medical service
Uniform clothing, re-issue of, to workmen, 614

UNITED STATES:
American Association of Genito-urinary Surgeons, *Transactions*, 250
American Child Hygiene Association, 922
American Dietetic Association, 613
American graduates in Europe, London's opportunity, 492. *See also* Post-graduate School
American Hospital in London, dinner to Dr. Charles H. Mayo, 62
American Pediatric Society—*Transactions*, 247
American Physiological Society to publish a review—*Physiological Reviews*, 771
Anglo-American University Library for Central Europe, 924
Antivivisection in 749, 794, 924

UNITED STATES *(continued)*:
Artbritis, chronic, in the army, 983
California and antivivisection, 749, 794, 924
College of Surgeons of America: Presentation of mace by the consulting surgeons of the British armies, 597—Leading article, 599
Congress against alcoholism, 571, 922—Attended by Sir Auckland Geddes, 922
Influenza deaths of the aborigines, 662
Morton, William Thomas Green, elected to American Hall of Fame, 771
Motor cars used by two-thirds of the medical men, 497
Naval medicine, a pioneer in (W. P. C. Barton), 90
Thermometers, inaccuracy of those tested in New York, 97
Venereal diseases conference, 713

Universities, conference in Australia, 491
Universities' Congress, 794. *See also* Congress
Universities in medical research and practice (Sir Clifford Allbutt), 1. (O)—Leading article on, 22. *See also* Medical Research
Universities, poverty of, 831
Universities, Scottish, class fees in, 839
Universities and State grants, 600
University of Aberdeen: Degrees and pass lists, 95—Information concerning the study of medicine, 349, 362
University of Adelaide: Note on, 255—Appointments, 255
University of Belfast: Chairs of gynaecology and obstetrics, 800—Degrees and pass lists, 30—Honorary degrees, 30—Information concerning the study of medicine, 352, 365
University of Berlin: Third surgical and fourth medical clinic opened, 789
University of Birmingham: Appeal, 838—Information concerning the study of medicine, 345, 359
University of Bologna: School of dental medicine and dental prosthesis opened, 685
University of Bristol: Degrees and pass lists, 96, 187—Information concerning the study of medicine, 345, 359, 369—Post-graduate study, 369—Presentation of portrait of Mr. F. Richardson Cross, 642
University of Brussels: Information concerning the study of medicine at, 367—Degrees for practitioners, 367

UNIVERSITY OF CAMBRIDGE:
Appointments, 96
Degrees and pass lists, 30, 60, 143, 226, 260, 646, 724, 874, 921
Fellows elected, 844
Honorary degrees, 60, 226
Information concerning the study of medicine, 344, 359, 370, 371
Molteno Institute of Parasitology, 187
Psychological medicine, 371
Tropical medicine, 370
Women, admission of, rejected by Senate, 955
Women students, 284, 874, 955

University of Dublin: Degrees and pass lists, 144, 992—Information concerning the study of medicine, 351, 365
University of Durham: Degrees and pass lists, 65, 570—Degrees for practitioners, 367—Information concerning the study of medicine, 346, 360, 367, 371—Psychological medicine, 371

UNIVERSITY OF EDINBURGH:
Appeal, 839
Appointments, 187
Cameron prize, 63
Class fees, 839
Combe Lectureship in Physiology, 187
Degrees and pass lists, 65, 93, 95, 612, 922, 955, 992
Diplomas in tropical medicine and psychiatry, 187
Entries for Faculty of Medicine, 607
Graduation ceremony, 95, 992
Honorary degrees, 93
Information concerning the study of medicine, 349, 363, 369, 371
Lord Rectorship, 452
New buildings, 93
Post-graduate study, 369
Psychological medicine, 371
Resignations, 187
Scholarships awarded, 804
University court, 187
Women students, 363

University finance, 168, 286
University of Glasgow: Brunton memorial prize awarded, 955—Degrees and pass lists, 144, 612, 804—Faulds Fellowship in medicine awarded, 955—Information concerning the study of medicine, 349, 363, 369—Joseph Coats memorial scholarship awarded, 955—Post-graduate study, 369—Special commemoration, 30
University Grants Committee, 168, 913—Parliamentary question, 913
University of Heidelberg to erect an institute for study of the chemical constitution of albumin, 608
University of Ireland, the National: Information concerning the study of medicine, 352, 365, 371—Psychological medicine, 371

University of Leeds: Appeal, 870—Information concerning the study of medicine, 346, 360, 371—Psychological medicine, 371—Medicine at (T. Wardrop Griffith), 670
University library for Central Europe, the Anglo-American, 924
University of Liége, urological clinic inaugurated, 417
University of Liverpool: Contribution of £10 000 by Cunard Company, 231—Degrees and pass lists, 96, 992—Diploma in medical radiology and electrology, 757—Information concerning the study of medicine, 347, 360, 370—Tropical medicine, 370

UNIVERSITY OF LONDON:
Appointments, 143, 187, 260, 770, 921
Bloomsbury site. *See* Site
Brown Institution, 143
Chemistry, chair of, 260
Degrees and pass lists, 30, 187, 260, 844
Degrees for practitioners, 367
Examiners, 922
Fellowship and prize, 143
Gold medals awarded, 260
Information concerning the study of medicine, 344, 367, 370. 371
Intercollegiate advanced work in physiology, 570
Lectures, 770
Matriculation results, 227
Meeting of Senate, 143, 260, 684, 770, 921
Mental deficiency course, 144
New buildings (parliamentary question), 796
Physiological laboratory, 143
Physiology, advanced lectures in, 456, 570
Physiology courses, 298
Psychological medicine, 371
Radiology, chair of, 143
Recognition of teachers, 260, 770, 921
Regulations for first M.B., 143
Regulations for internal students of medicine, 770
Site (parliamentary question), 137, 253, 290, 714, 796—(Leading article), 178—Letter from Board of Education, 532—Bloomsbury site, accepted, 684, 714, 796
Title of professor, 921
Tropical medicine, 370

University of Lyons: Chair of oto-rhino-laryngology created, 685
University of Manchester, the Victoria: Appointments, 770—Degrees and pass lists, 30, 96, 144, 187—Information concerning the study of medicine, 347, 360, 371—Psychological medicine, 371
University of Maryland: Professor of anaesthesia appointed in the medical school, 532
University of Montpellier: Chair of oto-rhino-laryngology created, 685
University of Nancy: Chair of oto-rhino-laryngology created, 685
University of Ottawa: Honorary degrees, 97

UNIVERSITY OF OXFORD:
Dale lectures 884
Degree days, 921
Degrees and pass lists, 30, 187, 804, 844, 874, 955
Gilchrist studentship, 143
Information concerning the study of medicine, 343, 359
Lectures, 921
Letter to Austrian and German professors, 647
Radcliffe prize (1921), 770
Roll of honour, 921
Scholarships, 143, 844
Theodore Williams scholarship, 143

University of Paris: To grant diplomas in puericulture and radiology and radio-therapeutics, 168—Post-graduate course at, 251
University of Posen: Faculty of medicine shortly to be organized, 608
University poverty, 831
University of St. Andrews: Degrees and pass lists, 96—Information concerning the study of medicine, 349, 364—Post-graduate course, 408—New principal, 950
University of Sheffield: Chair of Pharmacology, 989—Degrees and pass lists, 96, 187—Honorary degrees, 96 — Information concerning the study of medicine, 347, 362
University of Sydney: Degrees and pass lists, 185—New Dean of the Faculty of Medicine, 185—New professorships, 491—Resignations, 491
University of Wales: Information concerning the study of medicine, 348, 360—Chair of tuberculosis in, 763
Unmarried hospital residents. *See* Hospital
Unmarried mothers. *See* Mothers
"Unpopular causes," 675
Unusual cases, group of, 726
Ureter, calculi impacted in pelvic portion of, treatment of (Frank Kidd), 160—Discussion, 162—Correspondence on, 335, 454, 492, 530, 567
Urethral calculus, large (Sidney B. Radley), 593
Urethral naevus, 806
Urinary diseases, review of books on, 633
Urinary sinuses, case of (P. McRitchie), 516
Urine in toxaemias of pregnancy, diastase content of (R. L. Mackenzie Wallis), 273. (O)
Urological clinic inaugurated at University of Liége, 417

Urticaria after specific fevers, occurrence of (E. Ward), 279. (O)—Correspondence on, 492
Uterine fibroids. *See* Fibroids
Uterus bicornis unicollis, surgery of (J. M. Munro Kerr), 665
Uterus perforated by hydatidiform mole (R. C. Harkness), 744
Uterus, prolapse of, treatment of (F. Hamilton Lacey), 821
Uterus, ruptured, laparotomy for, Caesarean section in placenta praevia (Sir John Byers), 202. (O)

V.

Vaccinal condition of small-pox carriers. *See* Small-pox
Vaccination (Mary Scharlieb), 831
Vaccination against influenza. *See* Influenza
Vaccination, successful, 922
Vaccines in treatment of rheumatoid arthritis (H. Warren Crowe), 815. (O)
Vagina ruptured during coitus, 418
Vagus inhibition, 530
VAN GEHUCHTEN, A.: *Les Maladies Nerveuses*, rev., 703
VAQUEZ H. (and E. BORDEL): *Radiologie des vaisseaux de la base du coeur*, rev., 896
Varicella, notification of, 567
VARRIER-JONES, P. C. (and Sir G. SIMS WOODHEAD): *Industrial Colonies and Village Settlements for the Consumptive*, 600
Vaseline, tetanus bacillus in, 985
VEALE, F. de Coverly: Proposod telephone charges, 225
Vegetables, overcooked, influence of in causing scurvy among children (Harriette Chick and Elsie J. Dalyell), 546. (O)
VENABLES, J. F. (and T. Izod BENNETT): Effects of the emotions on gastric secretions and motility in the human being, 662. (O)
Venereal disease and alcohol, 756
Venereal disease, American conference on, 713
Venereal disease and the criminal law, report of committee, 908
Venereal disease courses at Hôpital St. Louis, 337
Venereal disease, development of the scheme for diagnosis and treatment of in Liverpool (E. W. Hope), 978
Venereal disease, International Health Conference and, 798, 840
Venereal disease, mortality of, 187, 223, 257, 294, 334, 454, 493, 529, 568, 611
Venereal Disease, National Council for Combating: Resignation of members, 31—Vacancy for medical man who is to go to the East, 261—To dispatch various commissions, 875
Venereal disease prevention: Deputation to Minister of Health, 80—Letter from the Society for the Prevention of Venereal Disease, 873
Venereal disease prophylaxis, 873, 920, 942
Venereal disease prophylaxis, special committee appointed to inquire into, 789—Note from Medical Women's Federation, 942
Venereal disease, review of books on, 439, 594
Venereal disease among seamen, 146, 798, 840
Venereal disease treatment centres, Ministry of Health's revised list, 416, 993
Venereal disease in women and children (Morna Rawlins), 194—Discussion, 196, 201—(Leonard Findlay), 197—Demonstrations, 202
Venereal disease. *See also* Syphilis
VENNING, Sir Edgcombe, obituary notice of, 874
Ventilation and open-air treatment, scientific basis of (leading article), 484
Verbum sapienti, 418
VÉREL, Raymond, obituary notice of, 569
VERNON, H. M.: Influence of dilution on the toxicity of alcohol, 638
Vernon Harcourt inhaler. *See* Inhaler
Vicary lecture. *See* Lecture
VICKERY, D. H.: Posture in defaecation, 300, 498
Victoria. *See* Australia
VIDAL, Dr.: Mother and child welfare in France, 909
Vienna, death rate still exceeds birth rate, 29
VINCE, Charles: *The Street of Faces: Glimpses of Town*, rev., 596
VINCENT, Swale: Medical research and education, 562
VINES, Howard William Copland, elected to a Beit Fellowship, 942
Vinesco invalid port, 551
Viscera, transposition of in two members of one family (S. L. Brimblecombe), 889
VISICK, Hedley C.: Self-administration of nitrous oxide gas, 769
Vision, theory of (leading article), 673—Correspondence on, 766
Vital capacity, review of books on, 323
Vital statistics of England and Wales, 79
Vital statistics: Registrar-General's weekly returns, 725—Quarterly returns, 805—Annual report for Scotland, 950
Vitalism, review of book on, 440
Vitamines in clinical medicine, present position of: (F. Gowland Hopkins), 147—(Sir James Barr), 150—(Harriette Chick), 151—(Elsie J. Dalyell), 152—(Lieut.-Col. R. McCarrison), 154—(Dr. Hess), 154—(Geo. F. Still), 155—(Leonard Williams), 156—(H. Corry Mann), 157—(W. H. Willcox), 158—(Eric Pritchard), 159—(S. Monckton Copeman), 159—Discussion, 160—Correspondence on, 222, 294. *See also* Deficiency diseases
Vitamines in margarines, 951. *See also* Oils, fat-soluble content of
Voluntary war hospitals. *See* Hospitals
Volvulus of the whole of the small intestine (C. M. Billington), 549
Volvulus of the small intestine following ileocolostomy (Norman Duggan), 889. (O)
VON PIRQUET. *See* Pirquet
VULPIUS, Oscar: *Aus 25 Jahren Orthopädischer Arbeit*, rev., 128

W.

WADDY, S. H.: Posture in defaecation, 846
WALDO, F. J., elected Master of the Plumbers' Company, 571

WALES:
Gift to the National Museum, 409
King Edward VII Welsh National Memorial Association, 311
Tuberculosis chair in Welsh National Medical School, 763, 793
Tuberculosis scheme, 137
University in (Sir Henry Reichel), 642

WALKER, Kenneth: Venereal diseases in women and children, 197—Latent syphilis in prenancy, 785
WALLIS, R. L. Mackenzie: Acidosis in disease, 73—Vitamines in clinical medicine, 160—160—Diastase content of the urine in toxaemias of pregnancy, 273. (O)
WALSH, James J.: *Mediaeval Medicine*, rev., 324
WALSHE, F. M. R.: Early symptoms of nervous disease, 694
WALTHER, Otto, appreciation of, 955
War, end of (parliamentary question), 714
War injuries, review of book on, 667
War Office and use of the Red Cross emblem, 804
War physical census (Sir James Galloway), 381. (O). *See also* Census
War problems in civil life (handbook on dysentery, trench fever, gas poisoning, etc., in relation to disabled ex-service officers and men), 553
War, sick wastage in, 601
WARD, E.: Occurrence of urticaria after specific fevers, 279. (O)
WARDEN, A. A.: Scientific relations with Germany, 529
WARFIELD, Louis M.: *Arterio-sclerosis and Hypertension*, rev., 479
WARTHIN, A. S: Ayerza's disease, 487
Wasp and bee stings, 924
Wassermann reaction, 224, 721, 841
Water rates in dispensing practices, 842
Water supply of London, report of Departmental Committee, 249
WATERS, H. G.: Influenza in India (1918-20), 591. (O)
WATERS, James Leith, obituary notice of, 646
WATSON, Sir C. Gordon: Surgical treatment of cancer of rectum, 739
WATSON, Chalmers: Bacteriuria, 820
WATSON, William B.: Case of bromoform poisoning, with recovery, 702
WATSON, W. N. West: Bradford Municipal Hospital, 766
WATSON-WILLIAMS, E.: Risks of operation for tonsils and adenoids in outdoor clinics, 887 (O), 951
WAUGH, George E.: Mobile proximal colon, 609
WEAVER, A. E. Remmett: Mortality of venereal diseases, 568
WEBB, G. Lowell: Subacute infective endocarditis, 920
WEBB, Helen: Treatment of mental disorder, 146
WEBB, J. Curtis: *Electro-therapy: its Rationale and Indications*, rev., 668
WEBB, Sidney and Beatrice: *A Constitution for the Socialist Commonwealth of Great Britain*, rev., 478
WEBER, F. Parkes: Secondary forms of polycythaemia rubra—Ayerza's disease, 658. (O)
Weed-killers, poisonous, Pharmaceutical Society on, 821

The Week:
Académie de Médecine, centenary of, 945
Adams, Francis, 673
Aërophagy, 794
Air transport, 674
Alcohol, fatigue and mental activity, 710
Alcohol toxicity, influence of dilution on, 638
Alcohol and venereal disease, 756
American hospital in London, 62
Anatomical Society of Great Britain and Ireland, 62

The Week (*continued*):
Angina pectoris, surgical treatment of, 793
Animal experiment and tropical medicine, 984
Animal experiments in 1919, 523
Annual meeting notes, 24, 60
Anoxaemia, 329
Antenatal death, 985
Antiscorbutic fruit juices, dried, 250
Antivivisection in America, 794
Arthritis, chronic, in the United States Army, 983
Ayerza's disease, 487
B. tetani, the omnipotent, 985
Barnes, Dr., of Carlisle, 866
Benevolent Fund Guild matinée, 756
Benzyl compounds, therapeutics of, 406
Bishops' dilemma, 524
Blind masseurs, 757
Blind, welfare of, 524
British Dental Association, 251
British Orthopaedic Association, 640
Canned food, 602
Cardio-vascular response to adrenalin injections, 486
Cats and diphtheria, 406
Cerebro-spinal fluid and hypophyseal extracts, 288
Charms, 947
Classified directory, 330
Cleansing churns, 488
Coal fire, 445
Coal mines, prevention of explosions in, 446
Comparative anatomy of the teeth, 25
Congress of universities, 794
Crimes of violence, 911
Dairy research, 639
Dances, drill, and games for children, 711
Death, conference on causes of, 601
Dental Bill, 674
Diet in Poor Law institutions, 712
Dietary deficiencies, effect of on the adrenals, 867
Duke of Connaught, F.R.C.S., 25
Early medical journals, 907
Educational number, 331
Eighteen hundred and eighty to nineteen hundred and twenty, 24
Elliston, the late Mr. Guy, memorial to, 983
Encephalitis lethargica, 829
Endocrine glands and dental disease, 867
Epsom College, 89
Finsen Institute in Copenhagen, 559
Food poisoning, outbreak at Brixton, 286
Foramen of Magendie, existence of, 526
Forgotten compresses in the bladder, 487
Fractures of great toe sesamoids, 408
Frozen fish, 910
Genito-urinary surgery, 250
German Institute of Psychiatric Research, 407
Gorgas, General, funeral service at St. Paul's, 88
Great general practitioner, a (Francis Adams), 673
Guyon, Jean Casmir Félix, 216
Heart surgery, 523
Herbert of Lea, Lord, 178
Home ambulance service, 866
Home ambulances, 287
Hospital and Poor Law infirmary, 985
Hospital question in New Zealand, 756
Hospitals, future of, 908
Hospitals, voluntary, grant to from the National Relief Fund, 331
In memoriam, 754
Income tax and post-graduate courses, 133
Industrial fatigue, 909
Insurance Act, the new, 63
Insurance for medical men, 946
International Congress of Comparative pathology, 287
International Journal of Public Health, 179
International Society of Surgery, meets in Paris, 132
International Union against Tuberculosis, 911
Intestinal pathology in the psychoses, 132
Inventor of the telephone, 908
Laboratory diagnosis of acute intestinal infections, 215
"Langham" telephone exchange, 832
Laryngeal paralysis, left recurrent, in mitral stenosis, 946
Laryngology, 25
Leprosy, island, 447
Leprosy in Norway, 795
Lister Memorial Fund, 132
London Medical Exhibition, 558
London School of Medicine for Women, 637
Lunacy in 1919, 602
MacAlister, Sir John, presentation to, 90
Macdonald, Dr. J. A., 24
Malaria in England, 830
Maternity and child welfare in France, 909
Medical aspects of war tanks, 909
Medical aspects of workmen's compensation, 133
Medical education at St. Mary's Hospital, 559
Medical graduate work in London, 89
Medical journals, early, 907
Medical Register, change of address, 180
Medical service scheme, 331
Medical Society of London, 526
Medical Society in Mesopotamia, 639
Medicine in the *Encyclopaedia of Religion and Ethics*, 910
Medicine and the law, 946

The Week (*continued*):
Micro-organism of typhus, 557
Middlesex Hospital chairs, 945
Milk, use of, 713
Money lenders and medical agents, 448
Moorfields Hospital, 556
Mother and child welfare in France, 909
Nasal anatomy collection, 755
National Association for Prevention of Consumption, 558
National Relief Fund hospital grant, 866
Navy, health of, 793
Nomenclature of diseases, 865
Optical instruments, standardization of, 712
Osler memorial, 63
Parliamentary session, 640
Payments at the London Hospital, 408
Petrograd doctors, plight of, 180
Physiology, teaching of, 525
Pioneer in American naval medicine, 90
Pleural reflex syncope, 26
Population, world, increase of, 675
Post-graduate course at St. Andrews, 408
Post-graduate course at the University of Paris, 251
Postural activity of muscle, 288
Pregnancy and pulmonary tuberculosis, 287
Prescription sign, 830
Presidency of the Royal Society, 754
Prince of Wales in Australia, 603
Psycho-pharmacology, 216
Public and tuberculosis, 985
Pure race, a, 328
Rabies in England, 755
Radiological institute, need for, 832
Red Cross and the League of Nations, 639
Research Defence Society, 249
"Right to strike," 558
Rockefeller Foundation, work of, 446
Rocky Mountain spotted fever, 485
Royal College of Surgeons exhibition of specimens, 640
Royal Earlswood Asylum, 407
Salvarsan, toxic effect of, 945
Sanatorium treatment of tuberculosis, 216
Science, the history of, 557
Scientific and industrial research, 525
Sero-therapy of tuberculosis, 792
Sick wastage in war, 601
Site planning, common sense in, 602
Spastic paraplegia, hereditary, 217
Specialists in oto-laryngology, 711
Spiroptera cancer in mice, 405
Stammering children, education of, 133
Starvation oedema 329
Statistics, new journal of (*Metron*), 712
Stevens's case, 795
Suffocation by collar of a nightshirt, 288
Surgical treatment of chronic gastric disorders, 831
Syphilis, maternal, and foetal mortality, 134
Telephone exchange, the new "Langham," 832
Telephone, inventor of, 908
Tetanus bacillus, the omnipresent, 985
Tetanus in home hospitals, 486
Traumatic Neuroses Committee, 408
Tuberculosis chair in Wales, 793
Tuberculosis conference in Liverpool, 217
Tuberculosis, domiciliary, risks of, 330
Tuberculosis, International Union against, 911
Tuberculosis of spleen, primary, 408
Tumours, coexisting primary malignant, 488
Typhus in Poland, 407, 447
Umbilical diphtheria in the newborn, 911
Universities and State grants, 600
University finance, 286
University poverty, 831
"Unpopular causes," 675
Vaccination, 831
Venereal disease and the criminal law, 908
Venereal Diseases Conference, American, 713
Voluntary and municipal hospitals, 638
Voluntary war hospitals, 180
Water supply of London, 249
White man in North Queensland, 526
World population. *See* Population
Zymotic diseases in London, 757

WEEKS, L. M.: Case of erysipelas terminating in acute thyroiditis, 476. (O)
WEICHSELBAUM, Professor, death of, 957
WESTCOTT, W. W. (and W. H. MARTINDALE): *The Extra Pharmacopeia*, rev., 78
WENYON, C. M.: Quinine in pharmacology and therapeutics, 120—Treatment of human trypanosomiasis and kala-azar by intravenous injections of acetyl-p-aminophenyl stibiate of sodium, 236
WHALE, H. Lawson: Intranasal dacryocystostomy, 701. (O)
Wharton's duct, fish-bone in (Jas. D. Mackay), 592
What to Tell our Grown-up Sons about Women, rev., 480
WHERRY, George: Diagnosis of glaucoma, 111
WHITBY, Charles J.: *Captain-Jewels*, rev., 705
WHITE, Clifford: Sodium bicarbonate tolerance in the toxaemias of pregnancy, 976
WHITE, F. Norman: Health conditions in Eastern Europe, 145
WHITE and GARLAND: Left recurrent laryngeal paralysis in mitral stenosis, 946
WHITE, Sinclair, death of, 251—Obituary notice of, 295, 415—Estate and bequests of, 613
WHITE, S. E.: Incipient mental disorder, 722
White and Martin's Genito-Urinary Surgery, eleventh edition, rev., 897
WHITEHOUSE, Beckwith: Surgical treatment of puerperal sepsis, 267
WHITTAKER, Charles R: *Surface Anatomy*, rev., 480
Whooping-cough, treatment of (cantharides, croton oil, and almond oil), 190
WILKIE, D. P. D.: Surgical treatment of cancer of rectum, 741
WILKINS, Arthur G.: Textbook as an index, 534
WILKINS, W. D.: Acidosis in disease, 73—Dementia praecox, 475
WILKINSON, G.: Modern theories of hearing, 859
WILLARD, Sylvester David, obituary notice of, 874 924—A correction, 924
WILLCOX, W. H.: Vitamines in clinical medicine, 158
Willesden Division *See* Association, British Medical, Branches *and* Divisions
WILLIAMS, Cecil: Periodic jaundice, 979—Purpura haemorrhagica, 979
WILLIAMS, D. J., bequests of, 416
WILLIAMS, John Frederick, O.B.E. conferred upon, 97
WILLIAMS, Major J. R., nominated High Sheriff of Carnarvonshire, 805
WILLIAMS, J. Whitridge: Maternal syphilis and foetal mortality, 134
WILLIAMS, Leonard: Vitamines in clinical medicine, 156
WILLIAMS, R. Stenhouse: Tuberculous milk, 722, 873
WILLIAMS, Tom: Determinants of morbid emotionalism, 322—Psychotherapy, 624—Early symptoms of nervous disease, 695
WILLIAMS, Ulysses: Latent syphilis in pregnancy, 785
WILLIAMSON, Herbert: Introductory remarks as President of Section of Obstetrics and Gynaecology, 253—Puerperal sepsis, 273, 452—Advantages and disadvantages of *x*-ray treatment of uterine fibroids, 537
WILLIAMSON, R T.: Diagnosis of spinal meningeal tumour and its practical importance, 275. (O)—Case of cerebellar tumour, 591. (O)
WILLIS, W. Addington: *The Law Relating to Housing and Town Planning in England and Wales*, rev., 246
WILLOUGHBY DE BROKE, Lord (and others): Venereal disease prophylaxis, 873
WILSON, C. M.: Clinical teaching units, 567—Future of the Poor Law infirmary, 987—Relation of voluntary to municipal hospitals, 987
WILSON, Harold W. (and George E. GASK): *Surgery*, rev., 704
WILSON, Helen Mary, appointed J.P. for Sheffield, 144
WILSON, J. Alex.: Nystagmus, 952
WILSON, J. T., resignation of, 491
WINDLE, Sir Bertram C. A.: *Vitalism and Scholasticism*, rev., 440
Winnipeg, vital statistics of, 592
WINTERNITZ, Major Milton C.: *Collected Studies on the Pathology of War Gas Poisoning*, rev., 594
WOLBACH, S. Burt: *Studies on Rocky Mountain Spotted Fever*, 485—Micro-organisms of typhus, 557
WOLLASTON, Alexander Frederick Richmond, elected Fellow of King's College, Cambridge, 844
WOLLHEIM, R.: Appreciation of Otto Walther, 955
Women doctors and income tax. *See* Income
Women doctors, married, London County Council and, 205
Women health visitors, 648
Women's service bureau, 190
Women students at Cambridge. *See* University of Cambridge
WOOD, D. R. (and John ALLEN): Diphtheria carrier of unusual type, 818. (O)
WOOD, Frances: Fertility of the English middle classes, 672
WOODHEAD, Sir G. Sims: Liberation of energy during the interaction of hypochlorous acid and living and dead organic matter, 586—(and P. C. VARRIER-JONES): *Industrial Colonies and Village Settlements for the Consumptive*, 600—Solution of the hospital problem, 719
WOODROW, Herbert: *Brightness and Dullness in Children*, rev, 323
WOODS, H. Fergie: Gall stones and parsley, 498—Disappearance of radial pulse during deep inspiration, 994
Woolwich: British Hospital for Mothers and Babies, foundation stone laid, 613
WORKMAN, Charles, estate of, 497
Workmen, reissue of uniform clothing to, 614
Workmen's compensation: Medical aspects of; report of Departmental Committee, 133
Workmen's Compensation Act: Fife coal company loses its appeal, 922
Worm infection in Indian troops of the Egyptian Expeditionary Force (F. H. Stewart), 592
WORSTER-DROUGHT, Cecil: A correction, 98—Condenser tests in diagnosis and prognosis of nerve injuries, 389
WORTHINGTON, Colonel Sir Edward, joins the staff of the Duke of Connaught, 958
WORTHINGTON, R, T., appointed regional medical officer to Ministry of Health, 771
WRAY, Charles: Intensifier for gas fires, 648
WRIGHT, Sir Almroth: Conditions of medical research, 797
WRIGHT, William: Treatment of calculi impacted in the pelvic portion of the ureter, 492, 567
WYARD, Stanley (and Sir Humphry ROLLESTON): Case of hepatic cirrhosis allied to Hanot's disease, 544. (O)
WYNN, W. H.: Tuberculous milk, 766

X.

X-ray apparatus for small cottage hospital, 685
X ray department at Bethlem Hospital, 680
X-ray therapy in "oriental sore" (J. Goodwin Tomkinson), 397
X-ray therapy in uterine fibromyomata (Louisa Martindale), 538
X-ray treatment of uterine fibroids, advantages and disadvantages of (Herbert Williamson), 537
X rays and the appendix (R. Allan Bennett), 316. (O)
X rays, review of books on, 895
X rays in diagnosis of tumours of thorax (Robert Knox), 392—Discussion, 395

Y.

Yearbook of the Scientific and Learned Societies of Great Britain and Ireland, rev., 79
Yearbook of the Universities of the Empire, 1918–1920, rev., 669
YORKE, Courtenay: Anaesthesia in tonsil and adenoid operations, 318. (O)
YORKE, Warrington (and J. W. W. STEPHENS), Problem of filariasis, 231
YOUNG, James (and D. A. MILLER): Etiology of eclampsia and the pre-eclampsic state, 976
YOUNG, Sydney, appointed member of Advisory Council to Committee of Privy Council for Scientific and Industrial Research, 144
YOUNG, W. J.: Some points in midwifery practice. 927. (O)
YULE, G. Udny: *Fall of the Birth Rate*, 671

Z.

ZAMMITT, Temistocle, appointed member of the Executive Council of Government of Malta, 685
Zentralblatt für Augenheilkunde suspends publication, 299
Zentralblatt für innere Medizin and *Zentralblatt für Chirurgie*, increase in the price of, 296
Zentralblatt für Physiologie to suspend publication at end of 1920, 837
ZONDEK, H.: *Das Hungerödem*, 329
Zoology, review of books on, 668
Zymotic diseases in London, 757

For List of Illustrations see back of Title.

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President's Address

ON

THE UNIVERSITIES IN MEDICAL RESEARCH AND PRACTICE.

BY

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WHEN last year we gathered together for the first time after the War we set ourselves only to the austerer purposes of our Association; then in my Address I did my best to review the principles and operations of modern Medicine in the light of the natural sciences, and by their standards to measure our progress and to forecast our future. To-day we meet full of diligence no doubt, but with more leisure. While ready indeed for those severer tasks which we are not to spare you, you will be glad also to brighten "the thorny pilgrimage of the understanding" with the pleasantness and beauty of our great Cambridge Houses, and the story of them; and after the rigours of natural law to find some ease in gossip and in the byways of the fallible.

When University College was founded in Oxford, and Peterhouse in Cambridge, England, after a long and painful gestation, was entering upon a new and a national epoch. Edward I, relinquishing claims for Continental dominion, set himself to make a kingdom and a nation at home. Dante was soon to sing the swansong of the Middle Ages; Chaucer—the father of Shakespeare—the morning carol of the new peoples. Gothic architecture, breaking through the uncouth grandeur of the Norman minster, lifted into the air its storied portals, and soaring arcades. Roger Bacon and William Ockham brought doctrine before the bar of reason, challenged tradition, and asserted secular rights, and Wickliffe the rights of private judgement and of freedom of thought; the clergy began to preach sermons in English. Of the thirteenth century were the great surgeons Hugh of Lucca, William of Salicet, and Lanfranc, and it was in those years that the Polo family crossed the Pamir plateau and explored China, Sumatra, and Ceylon. Half a century later came the still greater surgeon Guy of Chauliac. Letters also were shaking themselves free of the Church; John Van Eyck invented painting in oils; science and history were awaking from a long sleep; the universities were undermining the feudalisms of Pope and noble; Oxford, and still more Cambridge, were rebelling against the pharisaism of the University of Paris; Oxford, by the Thames valley, and Cambridge, by the streams of the Wash, were busy commercial ports whither the merchants of Florence, Venice, Nuremberg, and other foreign lands were bringing their wares to England; and in our Eastern Counties the woollen trade, still manifest in its noble churches, was entering upon a period of high prosperity. And not only was there new privilege for merchant scholar and burgher, but things were stirring also amongst the populace. The skilled craftsmen, a stubborn folk, were striking for their rights; and in the peasants' insurrection such cries as the rights of man, and natural equality, preludes to the insurrection of labour in the Eastern Counties two centuries later, were heard for the first time. Such was the dayspring of the thirteenth century and the first half of the fourteenth, a glory too soon to be quenched in the lurid cloud of the Black Death, and the miseries of the Hundred Years War. Yet even then in the desolated courts of Oxford and Cambridge the unconquerable mind of man did not fail to fan the perennial fire and to hand on the torch. To speak, as in duty bound, of my own College, Dr. Caius in defiance of faction and persecution, and under the shadow of war and pestilence, never lost his high courage, but held fast to an ideal afterwards to be abundantly real. Yet hardly before the spacious days of Elizabeth did the sun of peace and hope shine again upon our buffeted people. And now, if by the ascendancy of Medicine we have repelled the assaults of the greater epidemics, we have not escaped the desolations of war. The Allies, the living and the dead, have saved their honour, and we breathe again; are we saving our souls? As after the Hundred Years War, shall we see another renascence—a Columbus, a Colet, an Aldus, a Dürer, a Copernicus, a Vesalius, a Michael Angelo, a Paré? In science, it is true, we may be thankful; we have our Galileos, our Gilberts, our Parés, our Vesals; our heralds of creative art may come. A quire of new singers we have; are they tuning their harps to a new era? To-day our thoughts are turned to science, but the poets are our prophets.

A notion is abroad that Universities were "founded"; perhaps this is not true of any of the older universities; they grew. They grew in the needs of the age. In the religious houses, once the wardens of a learned tradition, the standard of learning, even among the Benedictines, had fallen very low. Not only in the thirteenth century but even a century or two later, our neighbours the monks of Peterborough and Croyland were unable to translate the homely Latin of their service books. The University of Paris grew, not without strife, out of her cathedral schools; and a stiffnecked and bigoted mistress she grew into. Generally speaking, universities grew up in centres of trade; and Oxford and Cambridge merchants with their primitive seats of learning were protected from raids by marsh and woodland. Colleges, as hostels for poor students—there was a trade Collegium or Guild in Cambridge in Roman times—were a later and not always an allegiant offspring. "Founded" they were, it is true; the older ones in part after the plan of the convent, in part of the manor house. The rule of Walter of Merton was on larger than monastic lines—wider and humaner. Moreover in the thirteenth century the sudden invasion of learning by the Franciscans.

as curious as it was transitory, made at least for some enlightenment, and some loosening of the bonds of tradition.

Mediaeval medicine in Britain was flat; it was far below the standard of Salerno and Montpellier. It consisted almost entirely in so-called "theory"—that is, readings of traditional galenic-humoralism, and uncritical excerpts from the Hippocratic Corpus conveyed through Syriac and other corrupt texts. Long and fantastic dissertations on the Pulse and the Urine formed a great part of these lectures. In the sixteenth century things were improving. The first Pharmacopoeia—to take the place of the innumerable and grotesque traditions of recipes—edited by Valerius Cordus, was issued from Nuremberg, in 1540, the year of the foundation of the Regius Professorships.[1] Quantities of medical books were published in the fifteenth and sixteenth centuries, a few of interest in so far as they brought some French and Italian Surgery into Britain, but otherwise mostly rubbish. But also about this time clinical records—the so-called "*Consilia*" or consultations—began to stuff theory with a little practice. Then followed the magnificent procession of Vesalius in anatomy, of Harvey and Haller in physiology, of Morgagni in pathology.

THE UNIVERSITIES AND THE PROFESSIONS.

We cannot meet in a University town without some reflections upon Education; but I fear your hearts will sink at the mere sound of the word. We are out of breath after our fights in many a dusty room with the "Classical" men; moreover for the present Sir George Newman, in his masterly Reports, has cleared our sight and defined our action. Still in Cambridge we must say a few words about our own business, and my scraps shall be few and short.

Boldly I will begin with the claim that the universities, ancient and modern, from Alexandria to Edinburgh, have made the professions. Universities have fostered research, and maintained standards—those standards so hard for us to keep in view. As somebody said, "van der Helst and Bol are good till you have seen Rembrandt." Conversation in universities keeps the mind open and flexible, and teaches that no craft is limited to the material with which it deals; we are not insects. Hence for each student the university stands for something larger than the field of a particular calling, for a more comprehensive design. We must be trained not only to learn particulars but also how to handle ideas. Tacitus[2] told us that no man should apply his mind to some particular profession till he had extended and strengthened it by a general culture, even as the earth is not sown until it has been turned and turned again several times. We are teaching Medicine well; but we need badly a *common literary basis*. I sometimes think "Classics" will have to come back as a "Modern Side." The public schools are teaching science far better than they did, far more seriously; but they teach too much detail and do not give concentration, nor grasp of principles. Narrow "specialization"—I use the common word—is found in medicine, as in other arts, among people of narrow culture; never among the Greeks, but abundantly among the Egyptians, the Romans before our era, the third century folk, and to-day in the tribes of Melanesia, Torres Straits, and Papua. Specializing is prone to be quackish; an acute observer says that "it means only an unequal distribution of ignorance." Such "experts," like mine ponies, never found their way, as happily many do in our day, through their little postern gate into the citadel of wisdom; the broader lines of the sciences are now more in view. But while the public has no standard the pretender flourishes, and the artist and the scientist, feeling themselves "misunderstood," become self-conscious and fretful.

Education must therefore from the first be an introduction to life; not forgetting that some study is a part of life. We must not suppose that cram, or as it is now called "intensive teaching," is only a feature of boys and examinees; many persons of multifarious learning are monsters of cram—cranks as we call them for short; they have little sense of selection, of relative values. Such products Gray had in view when he said to Walpole that "learning should not be encouraged, as it only drew out fools from their obscurity." Competitive teaching makes cranks, but happily the English boy is good at making "antibodies" to neutralize this perversity. Our scholarships are still too much on cram lines; the science boy cannot construct an English sentence, he knows no history, no art, and hardly any foreign language. The school teacher either works to a pattern to make the work of the examiner easy, or he is tethered lest he lead the pupil to browse beyond the common plot. The half medieval teaching of Medicine in the Oxford and Cambridge of my undergraduate days was deficient in solids; we were not even examined in surgery or midwifery; but we got far more of the imponderables. We did, and do, "teach people to think at least as well as any university in the world";[3] we do not, as Aristotle says,[4] present our pupils with their shoes ready made; we do not pass results without acquaintance with method and the work of the mind-building hands. We try to build up, first, character, the quality which has governed the world; secondly, to train in clear thinking, and to learn not to go beyond the evidence; thirdly, to impart particular knowledge and experience. In the words of Plato, we educate that "virtue and reason may become part of our natural being, and so easy and pleasant to us."

But we hope also to nourish yet another and still more precious quality than these, though not so well as we ought; it is most difficult to see how to nourish the imagination, the shaping and foreseeing faculty. The memory is exercised, the intellect is more or less called upon, but the centre of creative life and action—the imagination—is left out in the cold. If in Cambridge we have inherited from our forefathers some of the means of cherishing it, we do not face the duty as directly as we ought. The old university builders built for the imagination; not so the new. The artist and the craftsman[5] live their lives now in an alien world; for lack of exercise imagination languishes: yet science has sore need of it.

In Medicine the "curriculum" may well be called a *race!* The enlargement of knowledge and means implies more and more instruction; but the limits of the human mind are not indefinitely extensible. Some easement may be had however by simplifying our studies; by teaching our teachers; by recognizing two curriculums—one of the diploma and another of the university; by postponing some studies till after graduation. Let us consider first the alternative courses of study—of the diploma and of the university. Five years is long enough in all conscience for a young man to spend in learning to be a safe practitioner; many men have not the ambition or the private or bursarial means to aim at more than this. Some of them are more clever than intellectual, yet the world has need of them; and, if a university education is to be of a larger and more liberal kind, such a training cannot be given in diploma time, except to a few men who may come up a little later in life and partly prepared. The mean duration of our course is, I find, about six years and a half; some pass through in six years, some—and these often our best men—take seven. The last fraction of so long a course is taken either in clinical appointments after passing the "Conjoint"—the usual way, or in laboratory work. Unfortunately the medical student has virtually to decide before he begins which way he will take, for foundations must be laid in view of the superstructure. Pieces may be patched on afterwards, but, a few men of genius excepted, the later powers of mind are in proportion to the breadth of the whole educational plan. Even in geniuses—in John Hunter for instance—a lack of the larger early training makes itself felt in the later life.

I have so often urged the need of the "One portal system" that I will not now argue it again. Given the one portal, each university could enjoy freedom to mould its teaching after its own fashion and standards, and to transform its interior tests. The diploma course, on the contrary, must play up to outside examiners and, beginning with anatomy and physiology, must put immediate utility in the first line; although to seek utility may be to lose it. The tendency now is to make the Conjoint Examination a little too large and difficult. Again, the medical curriculum could be substantially lightened by

[1] The first London Pharmacopoeia was issued in 1618.
[2] Dial. 30.
[3] Testimony in House of Lords, July 12th, 1916.
[4] Last chapter of the Soph. Elenchi.
[5] The beautiful bridge and river gates of Clare College were designed by a craftsman, Master Grumbold, at a fee of three and sixpence.

better teaching. Upon individual teachers I make no reflections, many are admirable; I say only that almost none of them has been taught to teach; and but few are in a position to compare the methods of others with their own. The mind of a master moves much quicker than the mind of his pupil, and too often flies over his head. My young graduates tell me that some teachers mumbled, dropped their voices, and failed to construct the lesson with symmetry, coherence, and emphasis. If so, can we wonder if the progress of a class be tardy? To despise rhetoric, as a good Englishman does, it is not necessary to be formless or inarticulate. It took me five and twenty years to teach myself to lecture decently; a good instructor could have put me into the way of it in three weeks. Thirdly, the course may be shortened, and yet be enriched, by more blending of details into larger principles. To work out the detail of a soap-bubble needed a Kelvin; after him it could be expressed concisely in terms of surface tension. For our biology course the time is short, and there is no field work; we have therefore to do our best to illustrate its principles.

A very important report on our curriculum by the College Supervisors of medical study is now before our Special Board of Medicine. Among its proposals are better links between the several departments of study; and this implies short revision, or "rubbing up," courses at subsequent dates; as for instance of physics and chemistry in the pathology period. So again, as one of our advisers says, the student is slow to translate medicine into terms of physiology; these subjects too often lie in separate compartments of his mind. To pull things together some formal lecturing is indispensable. The first part of the Natural Sciences Tripos is invaluable in broadening the outlook of the student, and disciplining his thought; the Second Part is more for the abler men, or those who aim rather at research than at practice. Likewise, as regards Clinical teaching, unless in the case of students engaged in the scientific departments, who do not intend to practise Medicine, we do not encourage our pupils to pursue either clinical medicine or surgery in the University. Our field is too small. But, both in respect of the education and of the eagerness of the student, we find it of great advantage so to select cases from the Hospital as to illustrate the academic work on which he is then chiefly engaged. He is apt to wonder why he is shepherded along purely scientific courses while he, and perhaps his father, want to get to business. They ask if all this science teaching be not too remote, too "speculative." We meet such demurs by showing the student how directly practice is enlightened or fortified by the science even of the remoter ancillary departments. We show him, for example, a case of dropsy, of diabetes, of renal or suprarenal, or of cardiac disease, or of the action of a drug, in order to dwell upon the physical laws—mechanics, osmosis, adsorption, surface tension, etc., or on the biochemical laws, by which these morbid processes are disentangled. Thus we try to bring disease from an outer circle into the midst of physiology and chemistry.

Above all let us beware lest our teaching stiffen into formulas, the fetters of those practitioners who prefer the old theories with which they are familiar to the new facts which are unfamiliar. We remember the Télémaque of our childhood, "qui semblait n'avoir jamais compris ces maximes, quoiqu'il en fût rempli." Plowing and replowing without breaking new soil makes a hard-pan. So we get to value experience by formulas instead of formulas by experience; the entrance of wisdom is blocked, ignorance is disguised, habits harden, and the living issues are determined by the dead. Let us not rest in possession even of a truth.

The question often returns to medical and engineering teachers, whether or no some apprenticeship, some experience of the shop, be desirable for the student at the beginning, or in an early stage, of his career. There is some gain in it; the student is better aware of what he is after; on the other hand he picks up tricks, tips, and rules of thumb that have too high a melting point; on the whole, the loss seems to be more than the gain. But I think before undertaking private practice a year with a competent general practititioner might be made compulsory.

The Theses and Acts for M.B. and M.D. at Cambridge are invaluable to the young graduate. In the M.B. thesis, probably for the first time, he undertakes and has to put together a piece of original work; thus he finds what research means, and the use of his own wings, so thereafter he is a different man. The M.D. theses, which are submitted to a Special Committee, are of course on a larger and more arduous scale; many of them are permanent contributions to medicine or its ancillary sciences. For a diploma a thesis should not be required; many a one may make a fair practitioner who has neither time nor perhaps capacity to work up a thesis; but to allow graduation to any candidate who has not prepared for it a work of original research is, if I may venture to say so, unworthy of a university.

Of Graduate Classes I need say little; the subject has been well discussed. Hitherto this kind of teaching has been by a selection of side shows, not organized about the central schools. Thus, as the Jonathan Hutchinsons retired, the schemes fell to pieces. But now that, after infinite persuasions, we are obtaining "Clinical Units" at the great English schools, there will be some complete systems to attract disciples, some bones to the limbs. The duty of the full time professor will be not so much to instruct the younger pupils, who may find indeed more advantage in the various qualities of other teachers, but rather to organize and inspire a smaller body of senior students, and to offer the freshest and most arduous work for the riper home and foreign graduate visitors. The tentative, sceptical method of the investigator is hardly profitable to the junior student.[6]

THE DEBT OF OTHER SCIENCES TO MEDICINE.

I have said that I would not plunge with you this evening into the ocean of Science; but if you are a little tired of hearing of the dependence of Medicine upon Science you may find refreshment or diversion in contemplating the debts of Science to Medicine. My old medical friend Mr. Meade of Bradford was almost the only man who knew much about flies at the time when Manson and Ross began to watch these little pests. Without Medicine bacteriology, and the study of the cell, would have made slow way; yet it is the study of the cells of bacteria, of algae, of protozoa—not of mandarins—which has brought us nearer to the secret of life. On the wonderful world of the cell I have spoken before. Professor Hopkins has lately described to us the almost incredible coexistence in it of different constitutions, phases, and events; though every change in any phase affects the equilibrium of the whole cell system. And every one of these is essential to the whole; "so long, for example, as a liver cell remains alive its glycogen constituent cannot be wholly removed." If a cell be so ground up as to become more homogeneous, its reactions fall out at haphazard, and the cell dies by mutual destruction of its parts. This process of nature is illustrated on a mighty scale to-day in the disintegration of the Russian social organism.

Some of the apparently simple cell constituents, haemoglobin for instance, are incredibly complex; this substance is specific for every kind of animal; in allied species, if concordant, it is not identical. Of the chromosomes I need say nothing; except to hope that as x rays have analysed crystalline structure some such rays may analyse nuclear constitutions.

By another way, Medicine has promoted research on organic syntheses; and conversely on the reduction of foods into the more complex amino-acids before being rewoven into the tissues of life. From Medicine began our recognition of the plowman as the first parent of animals and man, and our fuller knowledge of "the green plant as the fundamental capitalist."

> Herbs gladly cure our flesh, because that they
> Finde their acquaintance there.

In the dark soil the nitrifying bacteria live on inorganic matter; so in the light some inorganic colloidal systems can build up formaldehyde (B. Moore). Medicine has introduced the chemist to the domain of the hormones and chalones, themselves also bodies of the simpler chemical constitution—some crystallizable, all able to resist prolonged boiling—blended into a wonderful physico-chemical co-ordinating system, secretly at work all the time under

[6] This I say because I infer from some prospectuses that the chief and his staff are proposing to organize junior classes.

the diagrams of the innocent neurologist. We may suppose indeed that every active tissue of the body, or every cell, even of bone and skin, or of the substrate of mind itself, like every individual of a social organism, contributes some element to the organic whole, some inward production necessary for growths, or for signals.[7] There may be a world of pathological (alien or perverted) hormones as yet unexplored. May the dive inwards of epithelial cells in cancer be due to some inversion of chemotaxis, possibly under the influence of an alien (parasitic?) enzyme? Within the body then all parts are the "environment" of each— so that we have both an inner and an outer "climate," an aspect of the microcosm not to be forgotten in the field of Mental Disease. Thus it is that "Each part may call the farthest, brother." And these agents have a field of action far beyond the body, as we see for example in the sexual hormones. If there be a "migration hormone" its sphere is the world.

Again, is it not largely by Medicine that the study of enzymes has thrown light upon the operations of catalysis which, like the rollers under a log or, as we now think, more by engagement and disengagement like rack and pinion, is incessantly forwarding, by various intermediate series, and by reversible actions at points of concentrative equilibrium, the processes of nature? The vitamines may be of this kind, agents which have upset our cruder calculations of nutritive values; for instance, in the feeding of children, we no longer take cane sugar to be the vital equivalent of lactose, nor margarine of butter; not all the nitrogen of nutrition is included in protein, nor are phospho- and amino-lipins, nucleic acid, amino-acids, and so on, mutually convertible in the body. We must admit that the fundamental principles of nutrition have yet to be redetermined. Moreover the war has forced us to remember the mutual dependence of food kinds; that of course fats and carbohydrates are not wholly independent or equivalent; the carbohydrates cannot make up any great lack of fats, nor can oxidation of fats proceed in the absence of carbohydrates.

Another system of balances in the body, as of the reciprocal functions of lung and kidney, is more obviously chemical. Medicine has taught us how the lung deals with the CO_2 ions, the kidneys with sundry other acids, so that the blood reaction is maintained with extreme nicety; and that other systems—for example, the vasomotor—are probably little less sensitive, and that there are other subtle causes of anoxaemia besides the cardio-pulmonary (Haldane); so that in Medicine it is of the first importance that in all abnormal conditions the oxygen tension of bloods should be systematically ascertained and compared. The hydrogen ion concentration is consistently higher upon flesh diet, lower upon vegetable diet; but I think we have not yet learned to discriminate so subtly as Charles Kean who is said to have chosen his viands according to the parts he had to play—pork for tyrants, beef for murderers, mutton for lovers.

Next after the origin of life itself, from ancient times to this day no enigma has attracted and baffled the curious mind of man more than that of living "form." Many of our keenest minds—Haldane, D'Arcy Thompson, Osborn, Dendy, McBride, I mention a few names as they occur to me—are still chasing this Will-o'-the-wisp; and moth-like I cannot but flutter after them. Of the nitrifying bacteria which assimilate inorganic matter, of the synthetic amines of animal nutrition, of the properties of colloids, I have spoken already to-day and last year; but "how," says Dr. Haldane, "is constant form maintained amid the continuous changes of our changing matter?" and—I may add—of variations of parts. Is "form" something after the manner of a seal, which is impressed upon matter? or is it, in Aristotle's sense, a kind of soul (entelechy) which shapes the potential, or capacity, into integral being? Here we hover between metaphysical or ontological concepts and natural law, or the properties of matter. A few years ago all notion of self-shaping was dismissed, and the animal regarded merely as a diagram of incident forces; to-day there is some harkback, if not to moulding entities, at any rate to some phases which partake both of germ and matrix. We had been taught that for development functional stimuli were all that was necessary; for instance, that the heart grew, even beyond the normal, only in response to demand for its work and by increased supply of blood to its tissues. But is there any functional adaptation from within? If a limb be not used the bone will still grow more or less; but why does the bone grow *round*? And an eye will grow, from a germ of it, in the dark (Loeb). Is there such a property in living matter as "functional adaptation"? Is function in its effect upon form adaptive or purposive? Is environment met by adaptive variation—for instance in a germ cell? Again, if so, can specific properties of such a kind be acquired? Biologists seem to have proved that evolution of form may go on continuously when environmental change is suspended, or remains constant; and conversely that environmental change does not necessarily induce evolution. On a broad view, says Professor Osborn,[8] during the infinite variety of the widely diverging forms of the Mammalian period of the earth, the reptiles have shown very little change. We perceive that these questions arise in some contrast with the hypothesis of the selection of "chance" variations.

On the other hand, we find reason to marvel at the constancy of bacterial species; humble and embryonic beings that we should not expect to have become fixed in their habits. Yet they and their enzymes are very exacting about it; as we find, for example, with the several enteric bacteria, or with the meningococcic or pneumococcic varieties, of which each has its own serous or agglutinin test, and is indifferent to the rest. And there is more still to be said: when the microbe finds itself in the host's body it may be wholly out of tune, or wholly in tune, with any or all cells that it approaches; in either case presumably nothing morbid would happen, perhaps, by a kind of zygosis, a benefit; morbid happenings would lie between this microbe and body cells within its range but not in tune with it. Now there seems to be reason to suppose that a microbe, on its approach to a body cell only just out of its range, may try this way and that to get a hitch on. If so, the microbe, at first innocuous, would become noxious. So on the other hand body cells may educate themselves to vibrate in harmony with a microbe before dissonant; or there may be mutual interchange and coadaptation. Such considerations arise out of many known phenomena at phase boundaries, of sympathetic vibrations, of acquired immunity, of new virulences, and so forth; the cells out of tune getting nearer and nearer into consonance with each other.

But, if things be so, surely we are face to face with a marvellous and far-reaching faculty, *the faculty of choice*, and this rising from the utter bottom of biology to the summit—formative faculty—"auto-determination," or, if you please, "mind." Can the microbe do as the retriever does when with a hare in his mouth he comes to a gate; he tries this way and that, then thrusts the hare under the gate, leaps over and pulls the hare through? So the microbe tries it on, this way or that, till it succeeds, by self-education in the school of experience—*Bildungstrieb*. This is far more—radically more—than "*élan vital*"; not merely energy but *choice*—plasticity driven to choose or fail; thus new devices are tried and new habits established. So likewise Dr. Topley has dwelt upon a microbe acquiring a capacity to bring about certain fermentations,[9] an ability, as he says, "to be regarded as something inherent in the organism itself." We may be reminded also of Professor Stanley Gardiner's "education" of his oysters—a very curious observation.

So far as I can think upon it there seems to be but one alternative hypothesis, but this does not cover so many phenomena. As I have said, if the vibrations of an alien cell are out of range of a certain body cell so as just to be indifferent but yet not far out of range, the vibrations of the one might induce like vibrations in the other, and meanwhile interference waves would arise in the field; thus disturbances—symptoms—would begin and continue until the two sets of waves should blend into unison; and this would mean acquired immunity. If a number of wag-at-the-wall clocks are hung near each other, in a calculable time they will get to swing in unison. But this hypothesis does not lead on, as does the trial and error hypothesis, to larger and larger gains. We see only a discord and a mode of requiescence; no line of development. What we apprehend is something more than

[7] Mathews, *Physiological Chemistry*, second edition, p. 835.

[8] Osborn, *Origin and Evolutions of Life*, p. 137.

[9] *Lancet*, May 22nd, 1920, where he quotes "Penfold and others."

orderliness of chemical reaction; that *cells are teachable*; a key to illimitable progress. Was not Coleridge right when he said

> For I had found
> That outward forms, the loftiest, still receive
> Their final influence from the Life within.

I am not for one moment forgetting that the physical modes of energy—adsorption, surface tension, and so forth—may count for much in these advances, arrests, immunities, and disintegrations. Adsorption, or other physical condition, may put up a block. How remarkable are the effects of anaesthesia and palsy which may follow injections of sodium oxalate and magnesium sulphate, and of their quick removal by calcium salts; indeed the whole influence of calcium on metabolism—probably all of them surface (interface) actions, as of any radio-active element upon cell function.[10] Indeed, as in the relation of foodstuffs to amines, so in the physics of the cell we may discover a comparative accessibility and intelligibility of the processes of life—Poincaré's "*simplicité cachée*." It seems that God has more "respect to the measure and ease of the human understanding" than Boyle supposed.

RESEARCH.

Thus we are led to the thaumaturgic word "Research" which, for some of us, means remote and rather unreal speculations; for others the discovery of short cuts to making more money; for others again the ideal of pure knowledge. Research may be regarded as of two kinds, as natural observation and as artificial experiment; the one yielding more and more to the other as investigation penetrates from the more superficial to the deeper processes. Still, if we are to surprise and "capture wild nature in her secret paths," the two ways are strictly inseparable. Indeed the infinitely little does man more harm than the enormously great. War may bring with it some redemptive virtues; pestilence only raw superstitions. The advance of the last half-century from the deadhouse pathology to more refined and penetrating methods we have witnessed in our time, and yet more intimate methods, those of biochemistry for instance, are being rapidly unfolded. Research, as it is working to-day, advances from fixed and measured bases; as observation it watches Nature's march past; then as experiment it puts events to test under artificial conditions of separation or isolation, and measures their phases. But the laboratory cannot, as Nature does, contrive the unexpected; so we must "gear up our tiny machines to the vast wheel of Nature," and try for a first roughing out of an idea or concept. If we are to select our facts to any considerable purpose as crucial, we must first have an idea in our minds; and for this a certain kind of imagination is needed, one of general concepts rather than of the concrete individualizing imagination of the artist. Thus there are two kinds of discoverers, whose comparative outlines we have not yet well discerned. Of scientific discovery Henri Poincaré gives an interesting appreciation; he says that discovery consists of three stages: the first stage is of laborious work at the problem on all sides; the next is not one of conscious occupation with the subject, but of unconscious cerebration, during which a promising hypothesis may unexpectedly arise in the mind; the third is deliberate verification and completion of form. Thus out of an unlimited number of possible combinations, and by many speculations, the discoverer at length divines the true one. In Medicine this has been clearly the course of surgery, the side of Medicine which is closer to nature.[11] The surgery of my young days was only too "observational"; the friendly fingers of curious colleagues were popped in and out of an operative incision with no apprehensions about "the infinitely little." Now the observer is sadly pushed aside; the ritual of surgery is become like the magic rites of old of which, if a point were dropped or a word changed, the virtue went out. But the rite could be done over again by the penitent; unluckily in surgical rites there is little room for repentances.

A new scheme of research into the origin of diseases, lately instituted at St. Andrews, claims our respectful attention. And may I be forgiven if here I pay a tribute to the rare devotion which inspired Sir James Mackenzie to forsake place and honour to follow after knowledge; indifferent whither he were led so long as truth was the leader. Sir James argues that the man in charge of the first deviations from health is the general practitioner; and that, if we are to detect diseases in their incipience, he must be the detective. One evening about the year 1879, when staying with Sir George Humphry, he and I sat into the small hours devising a method by which we hoped to engage the general practitioner in scientific investigation. We secured the co-operation of this Association and of many coadjutors[12]; Dr. Mahomed joined us as secretary. We hoped by gathering in large numbers of observations to eliminate error; and several series of questionaries were distributed. Four volumes of reports were issued, under such Editors as Humphry himself, (on Old Age), Butlin (on Cancer), Whipham (on Rheumatic Fever), and Isambard Owen (on Intemperance). But the effort was premature; the data were too rickety, the reports too often irregular, dilatory and imperfect, and the reporters untrained in observation, punctuality, and precision. As things are, few of our colleagues remember to let us know the issues of cases seen in consultation. We may hope now for better material and more accurate workers; not only so, but Sir James Mackenzie is developing another and no doubt better method; he is working with intense culture, on a small holding, and on a more intimate clinical plan.

In exploring a country the great watersheds and rivers are first laid down; to map out these and their valleys and tributaries is the first great work. These main features known, bearings are obtained whence to discover the contours of the hills, and to track up to the hidden sources of the streams. This is Sir James's mission—to track out the nascent rivulets, and with his divining rod to dig for the springs which feed the streams of disease.

Let us not suppose that this research will be but a matter of cleverness, sagacity, or even of intensive observation; nor flatter ourselves that because Mackenzie produced his great work on the *Pulse* while a general practitioner that he achieved this by ordinary clinical observation, however acute. The progress of Medicine must in large part be endogenous. While our pathologists in balloons were working on morbid phenomena without ever seeing a sick man, Mackenzie was bringing laboratory equipment, and exquisite laboratory methods, to the bedside. The polygraph, no easy instrument to handle even now, was the grandchild of the kymograph; and by it was proved again that science consists—as Plato said five centuries before Christ—*in measurement*. So in the St. Andrews research, not only have the initial warpings to be discovered, in their many ways and tides, but their volumes and their curves also to be measured as precisely as were those of the circulation by the polygraph. The physicist and the biochemist will need all their expertness in valuing molecular motions, analysing secretions, recording blood tests and morphologies, and so forth, in their earliest and subtlest phases. For it is in molecular dynamics that the first deviations will arise; massive visible changes come later, and happily are now in large part calculated, or calculable. Mere observation—Nature's march past—will not count for much now; and as to family histories—well, they vary with each historian. And we practitioners will need a more searching discipline before we can occupy ourselves with problems so subtle.

The laws of inheritance must, I think, be sought out, at any rate at first, on animals; the generations of Man are too long for comprehension; besides, something else seems lacking in this study of the Genetics of Man? . . . Is it a sense of humour?

COMPARATIVE PATHOLOGY.

And there is something more to be said. If light is to be thrown upon the generation of diseases in Man it must be in part also by study in a far larger field; we must discover and compare the elements and phases of disease in Animals and in Plants. Sir James Paget, in his admirable address to the Pathological Section of this Association at Cambridge in 1880, reflected on the difficulties of human pathology because of its great complexity. He had "long

[10] Gates and Meltzer, Rockf. St., vol. xxv, and *Journ. of Physiol.*, February 20th, 1920.

[11] See C. A., *Hist. Relations of Medicine and Surgery*.

[12] See Sir G. Humphry's Presidential Address at Cambridge, 1880.

and often felt that in this difficulty we might gain help from studying the consequences of injury and disease in the structure of plants" as less complex and under simpler conditions. To this field of pathology he devoted almost the whole of the address. A large part of my address in Medicine to this Association in Glasgow in 1888 was given to this appeal; it has found no response, hardly an echo. Yet what would anatomy be without comparative anatomy; language without comparative philology; anthropology, law, history, and even religion, without a like comprehension? Without an *Institute of Comparative Pathology* in Cambridge our range of vision and work is contracted. In the "Field Laboratories," it is true, Professors Woodhead and Nuttall, ably seconded by Dr. Stanley Griffith, are doing as much as lies in the power of a few individuals; but any such effort is puny beside the sphere of observation and research awaiting us. The comparative survey must cover the diseases of plants as well as of animals; of the lowest of living things up to the highest. The money loss year after year caused by the depredations and the diseases of animals and plants is enormous; and many of the methods of dealing with them—as with Foot and Mouth Disease and Swine Fever—barbarous; if at present imperative.

Yet no one stirs, save to gyrate each in his own little circle. There is no integration, no organization of research, no cross light from school to school, no mutual enlightenment among investigators, no big outlook. The destruction by insects in forestry and agriculture alone in Great Britain is put at £30,000,000 per annum.[13] An Institute of Comparative Pathology in Cambridge with the endowment of professorial chairs and subordinate workers would cost no doubt a quarter of a million, a big sum; but what is this to the wastage of disease throughout the world of life!—to swine fever, diseases of cattle and horses, of crops, of forests, and so forth—utilitarian ends it is true, but to be followed on paths of discovery which would illuminate the whole field of nosology. Diseases are not "entities," nor even recurrent phases of independent events, but partial aspects of a universal series. The young graduates we have, many of them of great capacity; but every day we are losing them because they are not taken up at once into scientific teams; so they slacken, or drift into some other means of livelihood, and things muddle on as before. How blind we are!

PSYCHOTHERAPY.

Even in a sketch of our present occupations, it is hard to avoid the subject of Psychotherapy; though I would gladly do so. Of late this pursuit has stirred up much mud, and once more the human heart is declared to be a very messy place. Perhaps we make it still more messy by talking so much about it; by making it a storm centre of faddism. Of transcendental psychopathology—of "Oedipus complexes" and their kind—I lie in an ignorance with which, as a Philistine, I am content. A distinguished professor in another field, of whom I inquired concerning certain transcendentalists of his own science, answered and said, "Of their opinions I can give no judgement, for I have not soared into their regions; I can only say that when perchance they stray within my orbit they are generally wrong." The psycho-analysts may in their own regions be great prophets, but where they come within ken they seem, to my presumption, to be vulnerable. The reader who in his own field has been wont to look for definition of terms, and for precision and economy of language, may think he sees in them loose thinking, vague outlines, and formless pseudoscientific verbiage—volumes of what undergraduates and others call "gas." There is the man who gets ahead of us by calling mind "mentality"; whose instinct prompts him generally to avoid facts by making his nouns more and more abstract. If painfully the reader tries to render recent psycho-analytic paragraphs into stricter terms he finds himself coming back to little more than Locke told the world three hundred years ago.[14] Many indeed of their postulates seem shaky. For instance, one cardinal, or at any rate dominant, axiom is that the sexual is the strongest instinct of mankind, and therefore a common denominator. But is it so? Offhand I should guess that self-preservation is stronger; and, for herding animals, the gregarious instinct yet stronger than either. Concupiscence a man may govern and abate, for months or years; of his life he may be reckless; but put him in solitary confinement and he goes mad. A sane mind consists in the good digestion of experience; in mental dyspepsia no doubt sexual and other instincts are prone to rebel—I am thankful to know that it does not fall to my lot to seek for pearls in that sty—but it is a long spring thence to deem that almost any mental dyspepsia is a sexual repression. Such speculations seem as ill digested as the "complexes" themselves. However, if such it be, what do we gain by the eructation of it? Something no doubt, but what? Mere liberty for the sexual idea? Hardly; let us try to guess. If we look back to Rousseau, and again to Augustine—the first self-analyst—we shall perceive that to many an agonized spirit Confession has been a great solace—just Confession. A murderer may be driven by inward strife to confess his crime, even to the first comer. The drive of the idealist to self-expression is the admiration of the historian. Why? Not, or not only, because his "complexes" are awry, or inhibition exhausted, but because a part of his mind is in solitary confinement. We all feel better when we have "had it out" with an adversary—we are restored to social communion. If it be true that sociable women cannot keep a secret, here may be the reason of it. But in the past experience has shown that the abuses of formal confession outweighed the advantages. We peer into the soul of another to discern the individual, and to tempt him back to the common opinion; and he in his turn is likewise sorely tempted to live again with his herd, or his gang. Yet to try to gain a mastery over the soul of another is not quite chivalrous, not quite generous; the propensity to spiritual "direction" may be as arrogant for the director as enfeebling of the will for the directed.

If then the socializing of the soul is to be handled by this kind of loveless confession, the method must be hedged about with stricter rules and guarantees. Let us hear no more that an enterprising medical psychologist had poured a stain into the heart of a pure minded woman which, do as she may, she cannot wash away; or, on the other hand, that "the confession did me good but never let me see that confessor again." The solace in weakness becomes in stronger moments a shame. Let us see to it that doctorism shall not come to sit beside militarism and ecclesiasticism.

The disorder then lies not so much in mutiny of the repressed as in feebleness of control. All normal mind building consists in the supersession of higher ideas upon the lower; that is in part on vigilant inhibition. No repressed idea should escape into the open without transmutation as it passes through the ideas above it. We see day by day how, as higher faiths weaken, the deeper superstitions in their crudity get loose. "*Jam vagâ prosiliet fraenis natura remotis.*"

We are learning in fresh terms the old truth that in the life of a social animal the power of "Suggestion" upon the mind and body is enormous; effects which again depend largely upon social reciprocity. We hardly realize that every hour we are living upon suggestions as we live upon the atmosphere. For good and evil, "suggestion" affects us most vividly in the experience of active life; but it is potent also in the written word. Our everyday lives are still full of taboos, and of the magic of mutual mimicry. A certain man in the War trenches swallowed by mischance a spider; his mate told him it was a venomous insect, and foolishly conspired with others to exclaim upon his ghastly looks. The jest was carried on too far; the victim fell into a collapse very near death. So likewise "ghost shooting" is a deadly sport.[15] "Miracles" are in large proportion works of healing, and certainly much of our pharmacy works by suggestion. "Put yourself under the treatment while it is curing people" was the shrewd advice of a late eminent physician. But, after all, suggestion makes for credulity; it is the method of the conjurer; and I repeat that its practice must be hedged about with precautions. It is a resort, if but for a while, to a lower plane, to a herd method; it uses an intolerable deal of emotion to a ha'p'orth of reason. Temporary uses it may have, to

[13] Mr. L. Scott, M.P., in the House of Commons.

[14] Locke told us of the sinking of the products of experience into the darker chambers of our hereditary nervous framework, below the limits of voluntary memory; that our minds, like our bodies, are voluntary in part, and in part involuntary; and that thorns may catch in either.

[15] Codrington, quoted Rivers, Fitzpatrick Lectures, No. I, 1915.

tidy up a mind in confusion; but—to say the least of it—it is not educative. We must trust others, it is true; we must walk in faith; but we must judge when and why. Are we not getting tired of such catchwords as "Will to power," and the like? for of course there are no such separate faculties, or even concepts, as Will, or Inhibition. Impulses must drive through some machinery, and the products depend on what the machinery may be. If then we are to train the impulses of another person we must first make or remake his higher mechanism. Suggestion without reconstruction, a simple change of gear, gives but a transitory relief; and what happens to chambers left only swept and garnished?

Albeit a remarkable and striking clinical research is being made into the psychic complement of structural diseases. I admit that in such diseases as tabes, disseminated sclerosis, even in ordinary hemiplegia, I had not fully perceived how far such a complement may be more than a fringe; that it may constitute much of the going symptom group. A study of like diseases in animals, and in the insane, who give no thought to the miseries of others nor their own, may throw much light upon the meditative and imitative tendencies in mankind.

The moral on the whole is that we must use much circumspection in straying beyond the strand of experimental psychology—a fruitful inquiry so long as pursued on the methods of science. I do not say that in its applications to the many and variable callings and stresses of life, there is no place for psychic empiricism, no place for prying beyond the margins of evidence; but the surer must be our footing on the known, and the closer our watch upon our terms. Not for one moment do I forget the admirable work done in psychology in our own laboratories, at Oxford, and in the great pathological schools of the Maudsley, and the London Hospitals, and elsewhere. And the methods of the Industrial Fatigue Research Board, for the study by "vocation tests" of the "psychological relations between management and labour," seem to me, if I may say so, to be on sound lines, and to be likely to shed light upon the economy of both mental and bodily work. Again, such researches as those of Dr. Scripture on the speech of epileptics, whether verified or not, are at least conceived on sound lines of scientific method.

The black fate which befell the insane, once so humanely, rationally, and happily treated by the ancient Greek peoples from Empedocles to Galen or later, is one of the monstrous depravities which befoul the history of man; centuries of cruelty which lasted down to our own times.[16] When a Commissioner in Lunacy, I did my best, encouraged by the late Dr. Hack Tuke, to convert the plans of new asylums from the barrack system to a village system; but every such attempt was thwarted by a stolid, idealess body, the Local Government Board of that day. A village community, with its homely associations, its groups of cottages, hospital, park, gardens, home farm and workshops, church, town hall and theatre, and its various social scenes and interests, would provide for nervous disorders of all kinds, and so lighten the shadow of insanity. Patients could be moved within the groups from one section to another without formal inquisition; with no more ceremony than precise entries in the case books open to the Visiting Justices. In the treatment of any case of mental disorder the physician may soon, and often suddenly, be faced with the necessity of bodily restraint; and I cannot satisfy myself that patients should become liable to mechanical restraint, or to confinement, without the strictest precautions and guarantees. At Whitehall we were never without some information, only too often true, of concealment of insane persons, and of their ill treatment in the sense of cruelty, or of bonds, or of coercion, or of neglect of proper domestic or medical care. The present obstacles to early treatment, it is true, are a grave hindrance to successful therapeutics, but the legal and practical problem is more intricate than public opinion is aware of.

GENERAL PRACTICE.

When I turn to Public Medicine I am met by two chief problems that call instantly for solution. If by studying the past we can better build up the future, what will history tell us of the future of the "General Practice" of medicine; and what of the Voluntary Hospital? He is a bold man who will pretend to foresee even the near future of either; yet neither can stand where it is at present. Let us consider General Practice first.

In England we cling to concrete experience; we look for friction, unexpected turns, compromises, chances; we have little belief in systems of thought and dialectics, and in medicine, as in political and social affairs, have trusted to experiment, to touch; we find safety not in ideal revolutions, nor in rigid organization, but in broadening down, in criticism, and in the fertility of intuitive action. Scientific therapeutics are not to cast out empirical methods. The compass of large principles is often too wide for daily needs. We want theories within theories, axioms of less scope but more readily adaptable to the wantonness of life. Very true; but also the craftsman must bow his head to the deeper and wider principles which will eliminate the inessentials, and economize the direction of his work. If the family physician must be rather receptive than productive, by the diffusion of scientific knowledge, and increasing familiarity with the spirit of science, the climate of thought will be changed throughout the profession.

The better class of general practitioner of fifty years ago was rather after the kind of Hippocrates, or of Paré, than of the modern graduate. His university, in the days before great cities,—the "great wens" of Cobbett—was nature; in his clinical experience he enriched the instruction, half empirical, half dogmatic, of his medical school by the shrewd, observant, self-reliant, resourceful qualities of the naturalist. His science and his practice were of the naturalist, not of the biologist. In my early days a country drive with such a doctor in Yorkshire used to be one of the rewards of the consultant; and a bedside talk with him a lesson in quickness of wit and hand, and of instructive inference and prognosis. He was as clever as the modern cardiologist in knowing when to give digitalis, when to withhold it; if he were content to diagnose a case as "some bedevilment of the liver," his rules of thumb were not without their efficacy, and his *flair* for the issues of disease marvellous. He did not come across much "science," and what he did see of it, chiefly in casual "locums," did not attract him; for in truth half-science was less useful to him than whole craftsmanship. He was a woodland guide, not a geographer; but, as Aristotle and Darwin well knew, the woodlander gathers much curious lore. However, in the march of intellect this comrade, kindly and loyal as he was, is gone: and his sort of wisdom dies with the individual. Who is to come next? The official doctor, or a family physician more intellectual and no less independent?

An official doctor would be as alert and as progressive as a country parson, whose service is not much kindled by the chances of promotion to an archdeaconry or a bishopric; while to shift an official doctor from place to place would be to cut the inner threads of those intimacies which we are now declaring to be clews to the detection of diseases at their sources. Yet, as things are, the independent practitioner is isolated; even in a town he is apt to make a little orbit for himself, to drift out of intimacy, perhaps into some jealousies, with his brethren; he lacks mental incentive, and gradually lets slip occasions of scientific reunion and renewal. Indeed, he cannot readily leave home to attend public and scientific meetings, so that too often—as Morant complained—"medical men do not think nor express themselves in a statesmanlike way." His time even at home is so broken up that he loses the habit of study. He may leave his hospital school full of ardour and in rapid growth, but in practice his ardour cools and he drops into routine; or at any rate such is his peril, and so less and less may the doctor feel himself a member of a great profession; he may drift out of public affairs, his outlook and sympathies may shrink, his work become a trade, and his medical neighbour his "opponent."

Again, for some years past a few of us have been protesting against the clipping of family practice by official shears. We see the subjects of infectious fevers carried into isolation, and the tuberculous and syphilitic disappearing with them. The children are turned over to the school doctor, the parturient woman to the new midwife, and so forth. What is to be the end of this pollarding of family practice? Are its branches to be scattered about in a wilderness of "specialists," and the family physician a mere sweeper up of unconsidered trifles?

[16] Pinel d. 1826; Schröder v. d. Kolk d. 1862; Conolly d. 1866.

Panel practice, for some time discredited by its hereditary taint of the Club of infamous memory, and by the continual dearth of the means of its development, should, if duly provided, expand into a large, honourable, and even universal department of medical work: the terms of engagement are to be more liberal; the clockwork is complete. But how is the practitioner to rise to higher standards of modern science and skill when no means of investigating disease, or of making an intimate diagnosis, are provided for him? He is well aware that the modern methods of medicine depend on such means as *x* rays, a battery of stains, and other cultural and biochemical apparatus; and not only an education in the use of these but also the time to give to them. What should we think of a regiment of recruits called out to fight the enemy but unprovided with weapons or munitions? If the doctor be near a university centre he can get blood tested for morphological elements, or for sugar or nitrogen content, excretions analysed, bacterial examinations and vaccines made, and so forth; but it is imperative that these opportunities, now confined to a few, shall be universal. Moreover if they are to be fruitful, the practitioner must consult personally with the scientist. These plants, then, and their staff must be established in all districts, together with a much larger provision of cottage hospitals. This university and its sisters are sending out every year bands of young graduates quite competent to deal with disease in all its forms, and to use refined means of diagnosis, if these means are supplied. If not, how can we blame them if they fall into some stagnant routine? In district laboratories panel work would be paid by the Ministry of Health; for private practice a tariff of fees would be agreed upon.[17] A considerable sum for the commencement of these local centres was contained in the stillborn Budget of 1914.

In the United States I am told that medical men are banding together in districts for such a development of their private practices. Five or six of them combine to rent a house with consulting rooms for each, and a common apartment for minor surgery, etc. Each member of the alliance—they are not exactly partners—is expected, in addition to his general practice, to take up special work in some department supplementary to the others; so that a fair variety of special skill may be available in the house; skill, if not of high expert value, which must still be sought elsewhere, yet quite sufficient for ordinary diagnosis and treatment. For this purpose visits of members to special clinics, and ordinary holidays, are mutually arranged. Patients like the system; they see that it is more thorough. Domiciliary visits become fewer, yet there is always one of the group on the spot. The fees are received by a secretary-attendant on the separate account of each member: and, after all upkeep expenses are met, the surplus is divided according to the credits of each. The individual earnings are higher than they were on the separate practices. Such are some of the material advantages; the spiritual are the disappearance of petty jealousies in a spirit of comradeship, and a larger freedom for scientific and social life, and for public service. The patients learn that a due remuneration of medical service is no longer gained by a multiplication of visits, nor by profits of dispensing.

These ends may no doubt be attained by different methods; but the essential need is the generally accessible laboratory and staff, to be a little academy and place of reunion; a centre, let us say, for the meeting of the Divisions of this Association. But one word of caution: this centre must not be municipal; it must be free of all kinds of officialism, and kept alive by a small committee of local practitioners in alliance with the Insurance Commission.[18]

As regards the Voluntary Hospitals, I omit what I had written because the Report of the Consultative Council has covered a much larger ground, and so ably, that my passing reflections would be of little use. The dilemma between the lack of funds and the fear, almost an assurance, that public grants in aid would discourage private munificence, might I think be avoided if, on proof of efficiency, grants in aid were offered in some proportion to the amount raised by voluntary effort. To range up the Poor Law Infirmaries with other hospitals and schools would enrich our clinical fields beyond all anticipation.

[17] Since this address was written the valuable Report of the Consultative Council has been issued; I cannot well recast these paragraphs and must be content to welcome this Report and to express my agreement with it.

[18] Such a laboratory was built before the war at Wolverhampton, and as I had urged the institution of such centres I was honoured by a request to open it. It was of course held up during the war, but I hear it is now fully at work again, and much frequented by the practitioners of the district.

PREVENTIVE MEDICINE AND CLINICAL PRACTICE.

On the social mission of Public or Preventive Medicine, and on its integration with clinical practice, Sir George Newman and others of our leaders have said what is needful, better than I could say it. It is strange that not until the other day—so to speak—has the public awakened to its own needs in this matter; seeing that, at least from the seventh century before Christ and onwards, public health officers were appointed in the Greek countries. Yet twenty-five centuries later my old friend Dr. Warburton of Pateley wore out his life, and much of a good practice, by his not unsuccessful fight against enteric fever in the valley of the Nidd; and, thank God, he was but one devoted warrior among many. Let us remember however that the public has neglected science partly because science has neglected it. Now the medical service of the Panama Canal, and of the Great War,[19] by specific immunization, brilliant sanitation, and modern methods such as the isolation of carriers, has brought medicine home not to each nation only but to all men as an international and reforming influence. Of late years surgery has made our advances conspicuous, but inner medicine is coming again into her own; nay, they are one. From lesser to larger groups the standard of health must be more and more the guide and the signal of the nation, of the country, of the city, of the workshop; for public health is purchasable. If, by his invention of tools, Man has become the destroyer of creation, let Medicine show that tools can also be its saviour. Every righteous physician regards his practice as a social service, a means not only of bodily but also of social reconstruction, and of moral and intellectual health. Thus Medicine will become more and more a binding force in societies, a bond between nations, and a purification of the world.

[19] See Sir Douglas Haig's Dispatch of December, 1917: "the preventive medicine man has saved his tens of thousands."

Proceedings of Sections.

SECTION OF MEDICAL EDUCATION.

Sir GEORGE NEWMAN, K.C.B., M.D., F.R.C.P., President.

INTRODUCTORY ADDRESS

ON

THE PLACE OF PRELIMINARY SCIENCE IN THE MEDICAL CURRICULUM.

BY

SIR GEORGE NEWMAN, K.C.B., M.D., F.R.C.P

THE form and content of the medical curriculum are dependent on two principal factors: (*a*) the advance of our knowledge of the science of medicine, and (*b*) the demands made upon the practitioner of the art of medicine. The purpose of a medical education is the equipment of the practitioner in knowledge and skill. In recent years there have been immense extensions of medical science, and in considering from time to time the character of the curriculum this is the first fact which must be borne in mind. The curriculum must incorporate the principles of medicine as interpreted in current knowledge. It must also comprehend its practice in relation to the needs of the time and the art of the practitioner. The expansion of applied medicine and the widening of the demand which the community makes on the medical man must thus find its counterpart in the curriculum. Science inspires art, even as the practitioner is the interpreter of science.

Let me refer to the first point. Sir Clifford Allbutt has

told us that "the new birth of medicine," of which we are witnesses,

> "is nothing less than its enlargement from an art of observation and empiricism to an applied science founded upon research: from a craft of tradition and sagacity to an applied science of analysis and law; from a descriptive code of surface phenomena to the discovery of deeper affinities; from a set of rules and axioms of quality to measurements of quantity."

Illustrations of the truth of these words are to be found in many paths of clinical work in medicine and surgery—in the diagnosis and treatment of diseases of the heart or the kidney, in abdominal surgery, in orthopaedics, in vaccination, antitoxin inoculation and serum therapy, in neurology, in parasitology and its applications to infective diseases, in our knowledge of the part played by the secretions and excretions of the body, in the treatment of syphilis, in the new understanding of metabolism, and in the application of the preliminary and intermediate sciences to the art of medicine. Nor is it only in practical medicine that we see signs of expansion—there is the new work on the cell—in physics, in chemistry and in biology. In science, as in every other field of human endeavour, the centre of knowledge is for ever shifting, but though it shifts in the direction of the infinitely little it is towards unity and cosmos. In 1801 Dalton announced his atomic theory. He showed that the element consisted of atoms, a view that was based on the proportions by weight of different elements in various chemical compounds, the constituent particles of which were of one kind. But by means of the electric spectrum it has now been shown that as the molecule had been divisible into atoms, so atoms are divisible into corpuscles or electrons, 1,700 times smaller than the atom, themselves divided into groups and systems and with potential and kinetic, chemical and electric, properties. The organic cell is also being reduced to its component parts. The cell theory—cell basis, cell division, the nucleus, the nucleolus—is yielding its secrets, and we now know something of the hidden powers of the chromosome of the germ cell and the internal secretion of chemical substances, whether they be hormone, toxin, or antitoxin. "The greater part of natural philosophy," says the Master of Trinity, "is the outcome of the structure and mechanism of the atom," and it is equally true that biological science is built upon the structure and function of the living cell. As we pass from the morphology of the cell to its physical and chemical powers and their interaction, there is unfolded an even larger field of vision, first of the functions of the human body as an aggregate of cells, then of their regulation, and then of their powers of regeneration and defence. It seems impossible to exaggerate the effect on the science of medicine of the new knowledge of the chemical and electrical changes going on in the cells of living tissue. From the discovery of hepatic glycogenesis by Claude Bernard in 1855 to the work of Schafer, Bayliss and Starling on internal secretion, one chain of evidence runs. It is certain that we must establish the student on this foundation of the cell, inorganic and organic, and its potentialities in individual or aggregate form, and the operation of natural influences upon it—internally the power of growth, secretion, reproduction, adaptation; externally a variety of factors, heat, light, electricity, stress, strain and pressure.

Secondly, the character of the curriculum will also depend upon the medical needs of the time. Two centuries ago, in 1720, Dr. Richard Mead, the foremost physician of his day, published his *Short Discourse*, one of the classics of modern medicine, which ran through seven editions in a year. It dealt with Levantine plague and the means of its prevention, and it laid down for the first time the wide compass of medicine in relation to society. It was one of the books which, expressing the medical needs of the period, left its mark on the medical curriculum. In that same year the first Alexander Munro was appointed Professor of Anatomy at Edinburgh, and the medical school of that University began its fame. Munro brought to the curriculum the applied teaching of Boerhaave of Leyden, the founder of modern clinical instruction. A generation later the work of Linnaeus, John Hunter, Morgagni, Haller, Cullen, and Priestley left its mark. Then as now the movements in medicine found expression in the curriculum. To-day we have two such factors at work—(*a*) the new claims of the State upon the doctor, social, scientific, clinical, and (*b*) the further development of clinical teaching within the curriculum—making their insistent demand on the student.

Clinical Teaching Units.

The establishment of "clinical units" is but an expression of the growth of integration. In the English and Scottish universities, and now in London also, we have a connecting up of all the subjects of the science and art of medicine, a further step in the abolition of isolated instruction.

"The whole curriculum of the medical student," says Professor Lorrain Smith, "suffers essentially from the difficulties which arise from the water-tight compartment system of teaching."

There is nothing celestial about the "clinical unit." It is merely a matter of convenient arrangement by which we secure three general advantages:

(*a*) The clinical teacher devotes a regular and substantial portion of his time to his teaching work, and instead of being casual, secondary, incidental or spasmodic, it becomes his chief task, and for the student instruction in clinical medicine and surgery is thus systematized, thorough, and always available.

(*b*) The unit consists of a staff of competent men working as a group or team who pool their experience—the physician, the assistant physician, the resident physician, the house physician—wards, out-patient department, laboratory, auxiliary departments for special forms of treatment—all in a composite unit.

(*c*) There is full integration of the science and art of medicine and surgery, the teaching of which may thus be raised to university standard. There is the association of research with study, and the study itself is intimate and intensive—it should comprehend Sir James Mackenzie's subjective and associated phenomena, it should investigate the mechanism of symptoms, and it should follow end-results back to their origins.

Two examples may be named in London and Edinburgh. At University College, London, Mr. Choyce has been appointed whole-time Director of Surgery, with two whole time assistants, with 40 beds, out-patients, laboratory accommodation, and special departments. The work of the unit consists of routine clinical work, teaching, pathological investigation and research (pathological, experimental, statistical), recording cases, and certain special branches of surgery (urology and orthopaedics). The arrangements for teaching include clinical demonstrations in the wards, supervision of dressers, systematic lectures on surgery, operative surgery, surgical pathology, practical and clinical surgery (senior and junior), and a surgical revision class. The unit co-operates with the extra-unit clinics of the hospital. Now the advantage to the students is that their surgical teachers are always available, and thus they secure personal and continuous tuition. They see surgery as a whole, and they discover a complete integration of its science and art, its essential integrity and unity. It is an impressive discovery to make. At Edinburgh there are seven surgeons, but Sir Harold Stiles is Regius Professor of Clinical Surgery, with an assistant surgeon, a clinical tutor and a house-surgeon. The unit contains forty-four beds, out-patients, and laboratory accommodation adjoining. The work of the week comprises ward clinics, systematic clinical lectures, tutorial classes, and operations. There is intensive study of the cases and exceptionally full integration of anatomy and pathology with surgery. In varying degree this kind of teaching is becoming the usual practice in the best medical schools. It is bringing with it closer study, larger vision, wider comprehension, a more intimate co-ordination of all branches of medicine, a deeper unity. It is the grand adventure of tracing the river back to its source.

Four Reforms.

Thus it is by the gradual evolution of this unit method over many years that we have come to see the necessity of further development in the curriculum. It is not Revolution we need, but Reform, and even reformers must have regard to the facts (*a*) that the scope and character of secondary education is not yet settled, (*b*) that medicine itself is in a transitional state, and (*c*) that the policy of the nation in regard to the ultimate nature of the public medical services has not yet crystallized itself.

Speaking generally, however, it appears that the main reforms needed in the medical curriculum are four:

1. *A lightening of the curriculum at both ends;* in other words, fuller preparation in science before entrance to the medical school, and a postponement of instruction in certain specialities and in general practice to the post-graduate period in order to provide continued education of the qualified man—teaching which requires organization on the basis of professoriate, hospital, laboratory and clinical experience—which may well be organized in such co-operative practitioner clinics as that devised by Sir James Mackenzie at St. Andrews, where knowledge is "pooled" and clinical research applied. This question of lightening without lengthening the curriculum is of cardinal importance. Much of our trouble arises from the overloaded condition of the five years. There is insufficient time allowed for true study, for digestion and assimilation. Several remedial steps may be suggested: elementary physics and elementary inorganic chemistry may be taken at the secondary school (the teachers of which, as suggested at Glasgow, may be brought into closer touch with the university and the needs of the student), though preliminary science for medical students must still be undertaken in the medical school; materia medica may be greatly reduced and some details of other subjects; the didactic lectures may be diminished in number; some overlapping may be eliminated; each term may be extended by a week and the medical course commenced in April; specialism may be unloaded from the final year or at least reduced in bulk; and above all the degree examinations may be shortened and modified by assessing the class examinations as an essential part of them. If the training of the student—his class marks, his preparations and dissections, his clinical records—be taken into account as part of his degree examination we should move the whole centre of gravity of the medical course away from the hazards and fortunes of the examination system, to the basis of a true and careful study of medicine. The examination should follow and not lead, it should test and not standardize, the training. The true criterion of university training in medicine is equipment for life, not preparation for an examination.

2. *A fuller study of the sciences preliminary to medicine* and a nearer application of these subjects to clinical work. Above all, there is great need of biology (anatomy and physiology). Its principles are the answer to many of our questionings. It is the fundamental theme.

3. *Development of clinical teaching of university standard,* particularly in relation to the beginnings of disease (the child and the out-patient), the science of prevention, the closer integration of various forms of clinical practice and of clinical with intermediate study, concentration on the protean diseases of tuberculosis, venereal, malaria, malignant disease, and an understanding of the social side of therapeutics (environment, diet, occupation, and the use of physical agents), as well as the social aspects of disease. Some of this clearly should come after graduation.

4. *There is need of further State aid,* though with a minimum of State control. The cost of proper medical training has now risen beyond the means of the average man, and yet it is in the interest of the State to secure well-equipped doctors. To provide a satisfactory medical education (*a*) we need more teachers, better teachers, and better-paid teachers; (*b*) we need clinical units; (*c*) we need improved laboratory accommodation and better equipment; (*d*) we also need an extension of hospital and clinic facilities for teaching—and all this means money and organization, both of which have been lacking in the past. The education of the medical man is no longer a proprietary or merely professional interest. It is of national concern—for the health of the people is the principal asset of the State.

Preliminary Science in the Curriculum.

To-day, here at Cambridge, we are concerned with only one of these four subjects—the place of preliminary science in the curriculum. Other and more competent speakers will deal with the fine adjustments of this subject. It is my duty to offer a few introductory observations.

1. In the first place it seems evident that the development of clinical medicine and surgery in response to the demands of the age makes a new and clear call for the improved teaching of the Preliminary Science subjects. Some advocate their removal from the medical curriculum. I am convinced they are more essential than ever. Look where we will—physics, chemistry and biology are key-subjects, absolutely fundamental. They form the basis of a general education in science; by their study alone are the principles of science grasped; they alone provide an education in technique and the methods of measurement, they give the student his scientific tools; they provide the elements and foundation upon which he builds; they are the only basis of sound generalization. The great medical subjects consist of physics, chemistry and biology applied to the life, form, and function of the human body in health and disease. The patient is a case of anatomy, of physiology, of pathology, to be interpreted and treated on grounds, and by means, which are essentially physical, chemical, and biological. He is, of course, something much more, but that is the essence of the situation. Taking the issue even on a lower plane: the practitioner of medicine must be trained in the processes of physics and chemistry to practise his profession. The mechanics of labour, surgical and orthopaedic appliances, temperature and thermometry; weighing and measuring; blood pressure, the behaviour of fluids and gases, specific gravity, siphons and pumps; colloids, surface tension, viscosity, diffusion, osmosis; heating, ventilation, lighting; optics, polarization; the microscope, the laryngoscope, the ophthalmoscope, the dental mirror; the stethoscope and the conduction of sound, resonance; electricity, x rays, radio-activity, thermo-therapy—the briefest catalogue demonstrates the enormous and expanding place which applied physics has in practical medicine. Every year adds to the medical uses of electricity—faradic current, galvanism, electric baths, high frequency—which is finding ever new fields of conquest. The physics of the cell has expanded beyond the wildest dreams of the atomist. Nor is chemistry one whit behind. The gathering of simples by the shores of the Aegean Sea and their medicinal preparation is recorded by Pliny as the earliest beginning of our science and our craft—five hundred years before Hippocrates and the golden age of Greece. From Galen to the herbalists little was done, but in modern times there has been prodigious advance. Iron and mercury; quinine, digitalis, opium, strychnine and belladonna; the coal-tar derivatives; ether, chloroform, salvarsan; fermentation, decomposition; the chemistry of colloids and of hormones; biochemistry and chemical physiology—all these remind us of our debt to chemistry, a debt which must be added to our growing knowledge of the chemistry of the cell.

Here it should be said that we are also in need of a closer association between physics and chemistry on the one hand and biology and medicine on the other. It is 120 years since Bichat and Dalton blazed this trail, but we do not pursue it in systematic fashion. We are content to ignore their mutual relationship and forget their current contribution to medicine. We shall do well to remember Huxley's warning that

> teaching in biology cannot be attempted with success until the student has attained a certain knowledge of physics and chemistry; for though the phenomena of life are dependent neither on physical nor chemical but on vital forces, yet they result in all sorts of physical and chemical changes, which can only be judged by their own laws.

Happily, the relation between chemistry and medicine is being drawn closer. At Edinburgh the teaching of both pharmacology and chemistry is being reorganized and co-ordinated under Professor Cushny, Professor Meakins and Professor Barger. There is to be a laboratory for clinical therapeutics in the hospital, the teacher of chemistry is to lay the foundations of physiological chemistry and clinical chemistry, there is an advanced course of medical chemistry for third and fourth year students, and after October 1921 students beginning the study of medicine will have to pass an entrance examination in elementary chemistry before admission. Professor Barger is not only expanding the teaching of chemistry but also dismissing a mass of conventional chemistry with which the medical student is not concerned.

> "General principles," he says, "are being illustrated by medical or biological examples . . . Frankly, one can only teach a few general principles and a few elementary facts, but these must be rubbed in deeply."

In physics too much excellent work is being done to give a new orientation to the student's mind in this regard. Miss Waller's course at the London School of Medicine for Women and the medical course in physics at Manchester illustrate representative methods, and in other schools the principles of physics are being brought into clinical application. The student is himself doing as well as reading. "Did you go yourself and examine this, or how do you know?" asks Socrates of Glaucon.

2. Secondly, the claim of biology is supreme. It is the very essence of medicine, which, indeed, is but one of its forms and expressions. It is not an introduction to medicine, but its foundation. If the medical man be not a biologist he is nothing. But to obtain its full value the student must be taught something much more than types. These are, after all, only pegs for principles—the types have their value as preparatory to human anatomy and physiology, to bacteriology and parasitology, but their real purpose is the demonstration of principles, the operation of biological laws—growth, reproduction, heredity, transmission, interdependence, the reserves of the body, the results of environment, cause and effect, use and disuse in organic life, adaptation, natural selection, variation, and mutation.

"Biology teaches the problems of life at every point," said Osler, "and may claim as no other science completeness of view and a comprehension which pertains to it alone."

It is necessary for the student to be well equipped in parasitology—particularly in regard to malaria, plague, yellow fever, typhus, trench fever, and dysentery—and the relation of entomology, protozoology, helminthology to human disease. The mosquito, the flea, the fly, the louse, the rat, have all come into our ken as factors in the dissemination of disease. But there is a still more important aspect of biology than that which is immediately utilitarian, namely, as the basis of comparative medicine. If there be one thing more than another which is lacking in English medicine it is its comparative study. It is the chief evil of the water-tight compartment system and of our methods of insularity. Here, perhaps, we need something of a revolution, for the absence of comparative medicine is a fundamental loss to the student and the practitioner. We render lip service to John Hunter, but we do not practise his method, except here and there in isolated fashion. But we must practise it everywhere if we would reap its harvest—in anatomy, in physiology, in pathology—in the vegetable kingdom, in the animal kingdom, in man, in men of all races. "We must know all disease to understand its several phases," and biology is the door. The great workers of the eighteenth century left us a rich legacy, and in our own day Prichard, Pasteur, Müller, Darwin, Virchow, Hutchinson, Turner, Allbutt, Bland-Sutton, have not left us without direction. Human anatomy, embryology, and physiology are parts of comparative anatomy; we build up our knowledge of man by study of the structure and function of animals. Likewise human pathology should be studied as part of a comparative pathology affecting both animal and vegetable worlds. Comparative bacterial infections; tuberculosis, anthrax, pneumonia, plague, cancer; the variety of bacterial species (forms of streptothrix, tubercle bacillus, typhoid bacillus, and pneumococcus), and their classification; parasitic disease and the skin diseases of animals; animal and vegetable poisons; tumours; the vast group of gastric diseases; the natural immunities of animals and man, race susceptibility; atrophy and hypertrophy—these are all illustrations of large groups of disease, characters or exceptions which are awaiting further comparative study.

There are two ways in which progress can be made. First, biology itself can be brought into a larger place in the curriculum instead of being, as in some medical schools, relegated to a subordinate position or even neglected—unequipped laboratories, poor salaries, little opportunity, perhaps feeble apprehension. No medical school is worthy the name if biology is subordinate. But if it is to be given its right place it must be taught in the right manner—as it has been taught by Herdman at Liverpool, by Hickson at Manchester, by Bower and Graham Kerr at Glasgow, by Arthur Thomson of Aberdeen, and in other ways also by Keith, by Elliot Smith, and by Karl Pearson. Secondly, much may be done by the teaching of applied biology as introduced by several of these teachers and by Professor Ashworth at Edinburgh.

"My object," he says, "has been to change the emphasis from the pure description of the animals chosen for study to the significance of the principles they illustrate in relation to the studies of the subsequent years of the medical curriculum."

In due time the course may be transferred from the first to the third year. In such a course it is possible to give due emphasis to the comparative study of the development of the ectoderm and endoderm, the origins of the blood and nervous systems, the functioning of sense organs, the formation of the body cavity, mesenteries, primitive excretory organs, the alimentary canal and the processes of digestion and absorption.

Special care is taken to show what a great step in advance is brought about by the coming-in of the mesoderm, giving rise to systems of organs and conditions which can be traced up to man—for example, the segmentation of the body, bilateral symmetry, separate muscle layers for the gut-wall (for peristalsis) and for the body wall (for locomotion), separation of the gut-cavity and body cavity, the appearance of excretory organs, blood system, central nervous system, the evolution of the anterior end, the parallel advance in development of the powers of locomotion and of sense organs, "cephalisation," which finally culminates in the vertebrate head.

The comparative study of protozoology, helminthology, and parasitology, and their relation to disease in man is the final issue of the course. This sort of work in conjunction with a broad grounding in the principles of biology seems to me to be the proper introduction to that wide grasp of comparative medicine which is as essential to the medical man of the future as it is to the advance of medical science. Here at Cambridge valuable comparative work is being done, a new movement has begun in Edinburgh, and the Bland-Sutton Institute of Pathology has been amalgamated with the Cancer Investigation Department at the Middlesex Hospital Medical School. In other schools also there are hopeful signs of progress.

3. There is a third point to be borne in mind, namely, the application of biology to society in the science of sociology where Huxley and Herbert Spencer led the way. The two chief needs of English medicine seem to be (*a*) the fuller integration of its several branches and constituent parts, and (*b*) its new relationship to sociology. Man is a social animal and all disease has its social aspect. The student must be taught this, he must learn to think how to use his stock of knowledge socially as well as logically. The great problems which will face him in practice have a social setting—tuberculosis, infant mortality, rickets, physical impairment, venereal, heart disease, mental abnormality—they all bear a highly complex relation to forms of human society, industry and government. I submit that the answer to these medical-social problems will be found in applied biology—for that is the basis of sociology, that is the science which deals with the problem of the real and ultimate nature of life, there the student and the practitioner will find what Wordsworth predicted in the *Prelude*—

> a Power
> That is the visible quality and shape
> And image of right reason; that matures
> Her processes by steadfast laws; gives birth
> To no impatient or fallacious hopes,
> No heat of passion or excessive zeal,
> No vain conceits; provokes to no quick turns
> Of self-applauding intellect; but trains
> To meekness and exalts by humble faith;
> Holds up before the mind intoxicate
> With present objects, and the busy dance
> Of things that pass away, a temperate show
> Of objects that endure.

It is not only a device here or an adjustment there, that is needed. It is the biological outlook and spirit that is required—the capacity "to see great truths than touch and handle little ones"—for biology, pure and applied, is the most educative, germinative and dynamic subject of the whole curriculum. It opens the windows of the mind, it makes possible a conception of the unity of things, and it gives proportion and measurement through the entire range of Medicine.

DISCUSSION ON PRELIMINARY SCIENTIFIC EDUCATION IN THE MEDICAL CURRICULUM.

OPENING PAPERS.

I.—COURSES OF STUDY IN SCIENCE FOR MEDICAL STUDENTS, WITH PARTICULAR REFERENCE TO BIOLOGY.

BY

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SINCE the time when I was a medical student at St. Bartholomew's Hospital, over forty years ago, there have been in medical education two important changes which have a bearing upon the subject of my address. In those days the majority of the students who entered the hospital were not required to pass any examination in chemistry, physics or biology, and they were able to complete their studies and become qualified medical men in four years from the time of entry. Since then, examinations in the science subjects have been made compulsory, and the period of study for a qualification has been raised to five years. The general result of these changes has been to bring the standard of medical education required both for those students who are contented with the ordinary qualification of the Royal Colleges, and for the university degree students, to a more uniform level. There is no longer the same distinction that there was in former times between the two classes of students, and in the first year of study all students devote practically the whole of their time to the study of science and all attend the same classes. Speaking from experience of the results of the examinations during the past twenty-five years, I feel certain that there is a tendency for the examiners of the Colleges to increase gradually the standard of their examinations, an increase of standard which is decidedly more noticeable than it is with the science examinations for a university degree.

I do not know whether it is the intention of the authorities of the medical profession to raise the standard of education for all medical men to the level required for a university degree, or to maintain and emphasize the distinction that at present exists; but in attempting to map out the courses of study in science that should be given to medical students as a whole, it is necessary to assume that potentially any one of them is capable of taking a position in the highest ranks of the profession. Any one of them may become a consulting physician or surgeon, a distinguished investigator of medical science, or a writer of standard works of reference. We cannot, at the present time, frame a course of study which is at the same time wide enough for a man who is to play a leading part in the profession and yet not include in it some subjects which may not be of much direct practical value to the man in a humble country practice. If a parent comes to me and says that the knowledge of the development of the chick or of the visceral arches of the dogfish will be of no use to his son in his practice, and that it is a waste of time to make him learn it, I can only reply that, while perhaps admitting the justice of his statement, my duty is to provide every medical student with such a scientific basis for his education as will enable him to rise to the highest ranks of the profession. It seems to me that, unless we have a clear direction from the General Medical Council to provide two distinct avenues, a higher and a lower, to a medical qualification, we, the teachers of science, are bound to assume that the same opportunities to acquire distinction must be offered to all students.

THE STANDARD OF GENERAL EDUCATION.

The question of the possession of the most suitable science courses for the first year study of the medical student is so closely connected with the question of his school education that it is necessary to consider what standard of education is, or should be, required before registration. At the present time a very large proportion of the students who enter the medical schools have passed some qualifying examination in languages, history and mathematics, but have no knowledge whatever of any of the sciences. It is necessary therefore for those in charge of the first year science courses to begin with the most elementary general principles before passing on to any branch or aspect of the sciences that have a direct bearing upon medical science.

On the other hand, there is a smaller number of such students who have had some instruction at school in chemistry, physics, and perhaps botany, and these may feel that the work of the first three months at the medical school is to some extent a waste of time. It seems, therefore, as if some of the difficulties might be overcome by providing two grades of courses for the first year, one in which an elementary knowledge of the principles of the sciences would be assumed, and the other in which these elementary principles would be taught. But such a plan is in my opinion both impracticable and undesirable. It would need a greatly increased staff and further laboratory resources; it would divide first year medical students into two classes which might easily become rival factions, and it would lead to serious difficulties in the conduct of courses in succeeding years. I am convinced that it is necessary to keep the first year students together as a single unit and to try to meet our difficulties in another way. The feeling that undoubtedly exists among many students that compulsory attendance on classes in elementary science, when they have already attended such classes at school, is a needless waste of time, is not justified. The principles of science as expounded by a new teacher and illustrated by new, and, in many cases, better experimental evidence, are usually both instructive and stimulating to the thoughtful student even if the substance of them is familiar to him. On the other hand, the student who has learned no science at school but has acquired the habit of study and mental exertion by a longer and deeper learning in the arts subjects, can grasp these first principles of science without much difficulty or repetition.

The real difficulty with all our science classes in the first year of medical study is caused by a minority—but often a substantial minority—of students with a low standard of school education. There are too many students entered by the medical schools whose vocabulary of their own language and facility in composition and correct spelling are not sufficient to enable them to profit by the lecture system, or to express what little they may have learned in a written examination. Further—and still more important—so many students do not possess a mind trained by mental efforts to remember or to think.

It is these students who act undoubtedly as a certain drag upon the machine, and so hinder the development of our courses in science on the lines which would be more suitable and more useful for medical men. With the resources at our disposal we are obliged to take the non-matriculated and the matriculated students in the same classes, at least for the greater part of the course, and there can be no doubt that the progress of the classes as a whole is seriously impeded by the presence of a minority of students of a low standard of general education. When we consider the long and arduous strain of a modern medical education, the variety of subjects and the mental flexibility that is required to grapple with them, and the ever-increasing demands for improvement in the medical qualifications, it seems as if the time has come when we ought to demand a higher standard of general education before a student is registered.

The first step in this direction is to insist that the lowest standard accepted for registration should be that of the matriculation examination of our universities. I will not discuss the vexed question whether Latin and mechanics of matriculation standard should again be made compulsory subjects for the entrance examination, but I believe that, if they were, the progress and success of students in the first year would be greatly facilitated.

There is another point in this connexion which should be also considered by the authorities, and that is whether the age at entry should not be raised. Every year there are several boys only a few months over sixteen years of age entering our classes as medical students. In some cases they do very well and may even become qualified by examination to practise before they are of age, but, in the majority of cases, they are too immature in intellectual development to profit by the first year's study and their early entry only leads to failure and discouragement. I think that, if the medical profession is to keep abreast with the educational movements of the times, to take

advantage of the improvements in the teaching of the higher classes in our secondary schools and of the higher standards of the school leaving examinations—the age of entry to the medical schools should not be less than seventeen years.

It has been suggested that, in order to provide more time for clinical work in the later years, the preliminary science studies should be transferred to the school period of the student's education. It would undoubtedly be an advantage if every student before entering a medical school could present a certificate of attendance on science classes in school or at a college, but I believe it would not be in the interests of the students nor of the medical profession as a whole if the standard required were in any degree lowered. There are not many secondary schools in which the standard of the first M.B. Examination in Physics and Chemistry can be reached, and very few in which there is any provision for the teaching of biology, and in consequence such a transference of science subjects to the schools at the present time would inevitably lead to a lowering of the standard. But, whether there is to be a preliminary training in science in the schools, or not, the first six months at least of a medical student's career in the university should be spent in the science departments.

In dealing with the subjects taken in the first year of study I think it may be assumed that chemistry and physics are essential. They are the fundamental sciences, and it would, of course, be a hopeless task for any teachers to attempt to carry students into any branch of medicine unless they could assume some knowledge of the elementary principles of these sciences. With the time at present allotted to these subjects during the first year of study, it is not possible to carry the student much beyond the first elementary principles, and there are several important branches of them which, though of special interest and importance to the medical man, cannot be dealt with at all. Perhaps in the near future, when the teaching of science in schools is better and more universal than at present, and when the school leaving age is raised by at least one year—as I trust may be the case—the courses given to registered medical students in physics and chemistry may have a more direct and practical bearing upon medical science.

Courses in Biology.

It is not within my province, nor is it my desire, to discuss the possible lines of improvement in the courses provided for medical students in these subjects, and I therefore pass on to the consideration of the courses in biology.

Having been a teacher of biology to medical students for nearly forty years, the simple question has been constantly in my mind, "What am I trying to do to help these young people in their preparation for the medical profession?" They come to us fresh from school and from the scholastic methods of teaching, too often impressed with the idea that learning is a daily task to be done and not thought about, and frequently believing that all they have to learn will be found written down in books, and they are prepared to use the same methods of remembering and forgetting by which they scrambled through their school lessons. The study of biology, physiology, anatomy, and of the subjects of the later years, opens up a new intellectual field to such students. They have to learn to co-ordinate their hands and eyes with the task imposed upon their memories, to distinguish between fact and theory, to cultivate interest in what they see and hear, and to begin to use their own judgement in matters that are not concrete. I might put these thoughts in the words of that distinguished surgeon and great thinker Sir James Paget, whose lectures it was my privilege to attend at St. Bartholomew's Hospital. He said in his last address to medical students, "A man must cultivate the power of careful observation and of cautious thinking." A medical student cannot begin too soon to cultivate this power of cautious thinking, and I believe that by the medium of biology, even better than by other sciences, the teacher can instigate and stimulate the power of cautious thinking.

This may be the most important object of the course in biology, but it is not the only one. It seems to me that, before passing on to courses of study in human anatomy and physiology, some introductory course of training in biological nomenclature and methods is absolutely necessary. We must remember that most of the students who come to us have never used a scalpel or a microscope, have never seen a heart or a brain *in situ*, have never been accustomed to verify the facts they are taught by reference to objective nature, and are quite ignorant of the use and meaning of many words which in the second year are in daily use. For such students the training that is given by the lectures and laboratory work on the structure and histology of such types as the frog and earthworm is invaluable. He learns for the first time to verify the facts of anatomy by dissection; he learns to use the scalpel, forceps and scissors; he learns to manipulate the microscope and magnifying glass, and he becomes familiar with the meaning of many words and expressions which he is obliged to understand if he is to profit by the subsequent medical courses.

There is another direction in which the course in biology may be made of great value to the future medical man. It may be urged, and perhaps with some justice, that the kind of training of hand and mind that I have already mentioned, can be acquired by the courses in anatomy and physiology. It can, but with much greater difficulty both for the student and the teacher. Moreover if this training is left to anatomists and physiologists, the courses in these subjects must be either lengthened or greatly simplified. Further, there are some things that may be of immense value for the medical man which can and should be taught in the biological course and cannot, under ordinary circumstances, be dealt with at any later stage in the medical curriculum. In his address to the International Medical Congress in 1881, the late Professor Huxley said:

> Historically the connexion of medical science with the biological sciences and the full extent and intimacy of that connexion are only now beginning to be apparent.

Again:

> It is a peculiarity of the physical sciences that they are independent in proportion as they are imperfect, and it is only as they advance that the bonds which really unite them all become apparent.

I do not think that Huxley himself would have ventured to predict how rapidly the advance of knowledge would reveal the bonds that unite biology to the medical sciences. We have seen since 1881 the inception and rapid growth of medical protozoology and of medical entomology, and we have witnessed great advances in our knowledge of animal parasites and of the laws of heredity derived from biological research. All of these form a series of most important links with medical science. There is one time, and only one time, in the career of the medical student when the nature of these links between medicine and biology can be indicated, and that is in the course of his biological studies during the first year. With the time and opportunities at our disposal, it is, of course, impossible to deal adequately with any of these links, but a great deal can be done, by some reference in the biological course to all these later developments of the subject, to stimulate interest and to assist materially in future private study.

Reform of Zoological Teaching.

With these three ideals in mind as to the aim of the course in biology, let me now consider how the course can be arranged so as to attain them as far as possible.

There was a period not very long ago in the history of medical education when the course in the zoological part of biology consisted in the study of the anatomy and development of a large number of animal "types" as they were called, and the detailed knowledge of these types that was given by the teachers and expected by the examiners left little time for any study of general biological problems or reference to the applications of biology to the medical sciences. This "type" system, as I may call it, had some advantages in the early days of its existence, for at least it provided a good training in accurate observation; but as time went on and the textbooks, illustrations, and notebooks increased and improved, it led too much to the method of "cram"—students tended to neglect their lectures, to commit passages from the textbooks to memory, and, worse still, to scamp their dissections in order to copy the diagrams. The first step in the reform, then, must be a reduction in the number of "types" of which a detailed knowledge of structure is required. But we cannot entirely abolish the type system, and a general knowledge of the anatomy of such forms as the frog, the

earthworm, and hydra, should be given as an introduction to the study of animal structure, as a training in anatomical method and as a means of cultivating objective study.

For another purpose there should be given some lectures and laboratory work on an Elasmobranch fish and on a Mammal, but I think that the detailed knowledge of the whole anatomy of these vertebrates which is sometimes expected of students should not be required. I imagine that the dogfish was first introduced into the first M.B. biology schedule for the purpose of assisting the student to understand the complex anatomy of the human head and neck, and I believe that it has admirably served this purpose. To the student who begins his anatomy without some previous knowledge of the lower vertebrates, the distribution of the cranial nerves and of the larger arteries and their relation to skeletal structure is a chaos without interest or meaning, and the facts have simply to be committed to memory. A study of these parts in the dogfish does give an intelligent student the invaluable savour of interest and explanation. While, therefore, careful instruction should be given on the heart and arterial system, on the brain and cranial nerves, on the visceral arches and their relations, and also on the kidneys, there are many details of the structure of the dogfish which might well be omitted.

The same remarks apply to the Mammal. I think we give too much time at present to the details of the anatomy of the rabbit, time which could be far more profitably spent on other matters. In the study of the rabbit, stress should be laid on its essential mammalian characters, on the structure of the heart and aortic arches, the brain and cranial nerves, the mammalian characters of the vertebral column, pectoral and pelvic girdles, limbs and teeth, on the reno-reproductive system, on early stages of development and on the formation of the placenta. Such a study, I believe, is really a very great assistance to the student in the understanding of the human anatomy which he is taught in the second year, and it is also an introduction to the method of comparative anatomy which may be of immense value to him by stimulating scientific thought and indicating the importance of anatomical investigation.

In dealing with the three vertebrate animals just referred to, some lectures must be devoted to the question of the fertilization of the ovum and its segmentation, to the formation of the germ-layers, and to some of the elementary facts about the development of the organs. I regard this part of the course as one of the most essential, because it is the only time in the career of the medical student when the first principles of comparative embryology can be taught and illustrated by actual specimens or preparations of the early stages of development. Facilities for adequate laboratory work may vary in different schools, but at least the early stages of the development of the frog and the first three days of the development of the chick from the beginning of incubation can be demonstrated. In well appointed laboratories preparations can be shown of the formation of the polar bodies, of the fertilization of the ovum, of the blastula and gastrula stages, sections of the later stages of the frog and bird, and some preparations of the development of the mammal. In the later stages of his career the medical student has to learn something about human development—that is to say, about the development of one of the most highly organized genera in the animal kingdom—and it is only by learning some of these first principles of embryology in his first year that he can study intelligently the development of man.

In dealing with some selected examples of the protozoa we introduce the student to a field of thought which is probably quite new to him, and we have to try to meet the difficulties inherent in things of microscopic size and, apparently, of the simplest structure. But these things also bring him into contact with the fundamental phenomena of things that are alive, with protoplasm, which Huxley so aptly called "the physical basis of life"; with the essential features of nucleus and cytoplasm; with the function of sex and with the problem of death. When he has recovered from his first impression that amoeba is "the simplest living organism" and begins to realize the complexity and instability of all vital processes, and reaches the conclusion that there is no animal or living part of an animal that can be correctly described as simple, the time has come when reference should be made to some of the fundamental problems of biology. This may be the only time in his medical career when his attention will be directed to such questions as vitalism, the origin of sex, the cell theory in relation to the protozoa, the theory of epigenesis, and other problems of biology that are still controversial.

I have a strong conviction, which I venture to submit to your consideration, that some acquaintance with these fundamental problems should be a part of the equipment of every medical man. I do not suggest that it is possible to deal at all adequately with any one of them in the course of biology, but a few words in a lecture stating the problems and an impartial explanation of the current views concerning them often leads to habits of private study and contemplation which is of lifelong interest. There is no part of the whole course of biology in which the attention of the class can be more firmly held than that which deals with these important matters of controversy, and there is no better opportunity than this for the teacher to use his powers to stimulate in each student the habit of cautious thinking, which is undoubtedly one of the best results of a good medical education.

During the many years' experience I have had as a teacher of biology I have heard many criticisms of our course from eminent representatives of the medical profession. What is the use, it has been said, of teaching the medical student about the appendages of a crayfish or the foramina on the skull of a dogfish, or the course of the alimentary canal of an earthworm, or the structure of a rabbit's skull? With the many and increasing number of subjects that have to be taught to render a man proficient in his profession, it is waste of time to make him learn things in his first year which have no bearing on his professional work.

I have always felt that there is some justice in these criticisms, that too much detailed knowledge is taught in some of the schools, and that examiners in biology give more respect than they should do to a mere recitation of facts that have been committed to memory. I am inclined to think, also, that what I may call the schedule system has stereotyped the course in such a way as to check any tendency there may be to meet new needs as they arise. Many of the teachers of biology would, I am sure, be only too glad to vary the course from year to year in order to call attention to the new investigations of biological science which have a direct bearing upon medicine; but we are hide-bound by the schedules, which were in some cases drawn up and fixed for the students of ten or twenty years ago. I think we ought to make it an essential part of the course to give some instruction in those lines of advance which bind more closely biological and medical science.

Let me give a few examples to illustrate my meaning.

At the time when most of our schedules were drawn up very little attention was paid to the question of the relation of insects to disease, with the result that the medical student as a rule passed through his course in zoology without gaining any knowledge of the characters of an insect, or of the way in which it may carry the germs of disease. Anything of the nature of a course of lectures on medical entomology is out of the question at this stage, but in two or three lectures a great deal can be done to clear away the fog of complete ignorance of insect life. There are many ways in which this part of the subject could be illustrated. In the biology course at Manchester I have, for some years past, given a short account of the structure and life-history of the house-fly (*Musca domestica*) and for comparison have demonstrated the difference between the house-fly and the stable-fly (*Stomoxys calcitrans*). A few words of explanation of the different ways in which these two insects—so much alike to the naked eye and yet so different in important respects—may carry infection are quite sufficient to convince the medical student that he is learning something that has a direct bearing on his professional work. At any rate, I believe that none of my old students will tell their patients that the house-flies begin to bite in September.

There is another direction in which these bonds that link the sciences together should be illustrated. In dealing with the protozoa some reference should be made to the systematic position and life-history of the malaria organism, of the trypanosomata, and of the endamoebae of the human intestine. It is not necessary nor desirable that an attempt should be made to deal fully with these organisms. That should be left to the later studies in the departments of pathology or public health, but some reference to them in the first year should be made in order to clear the mind as to the relation between the two sciences.

There are many other subjects of the same kind that might be dealt with if time permitted, such as the story of ankylostoma, the miner's worm, the life-history of

bilharzia, the life-history of the human cestodes, an outline of modern researches on heredity, and the zoological position and special characters of man.

I do not suggest that all these subjects can be included in a schedule which is to be rigidly adhered to, on the principle of "no more and no less," but I think the teachers in the schools should be encouraged in some way to indicate to the students more definitely than they have done in the past the bonds that bind together the sciences of the first year with those of the later years of their medical career. I would plead also for a greater freedom for the teacher, so that he may vary the course from year to year in certain directions, according to his discretion and personal qualifications, in order that the course, by experiment and by experience, may be improved and widened in accordance with the needs of the times.

It may seem to some who have heard me call attention to the various subjects which it seems desirable to include in the Zoological Section of the course in biology in order to make it useful to the medical student as an introduction to his medical studies in later years, that such a course would be unwieldy and cumbersome; but I have not included anything which practical experience has not shown can be dealt with in a six months' course, provided that the teacher has some control over the examination. It may be difficult to attain to an ideal course under any circumstances, but the difficulty is infinitely greater in those cases in which the examiners have no personal knowledge of the examinees, nor of the courses they have attended. Still, notwithstanding these difficulties I think the course in many medical schools could be greatly improved in quality and rendered less rigid than it has now become.

What is wanted, it seems to me, is to widen the basis of the course, to make it less an effort of memory of details than it is at present, and more an introduction to a wide field of scientific thought, to awaken interest and to encourage discussion, to stimulate inquiry and to cultivate the "habit of cautious thinking." It is true that the medical student forgets many facts and details learnt in the biology course; that is inevitable, but it is not a peculiarity of this particular course. Very few medical men, I take it, would like to sit again for a second M.B. examination without previous revision. The facts in themselves do not matter much: they are, as it were, the scaffolding which enables the structure of a medical education to be built up; and if they have performed their function of giving strength and purpose to the design as a whole, they can be discarded.

Botany in Medical Education.

Many of the remarks I have made about the zoological part of biology apply with equal force to the botanical part. The time has long gone by when a knowledge of the herbs of the fields and woods was a necessary part of a medical man's education. This link, which in former times bound botany with medical science, has broken, but there are other links which become stronger every year as our knowledge of the sciences advances. If it is one of the objects of the course in biology to impart some knowledge of the vital processes, of the actions and reactions of protoplasm, and the essential character of that unit of protoplasm which we call the cell, a course from which all reference to the vegetable kingdom is excluded would be almost grotesque. Whether it would be possible to shorten the botanical course by the omission of some parts that are not strictly relevant to the objects we have in view I do not feel competent to say, but from what I know of the courses in botany in the English medical schools I feel very strongly that the substitution of a preliminary course of human anatomy for a part of the course in botany, would not be a gain from the educational point of view. The study of the organisms that lie on the vegetable side of the imaginary line that divides the animal from the vegetable kingdom—the yeasts, the bacteria, the fungi and the lower algae—is so intimately connected with the more advanced studies in cellular and chemical pathology that it forms an almost essential part of the medical curriculum. Vegetable cytology and the evolution of the sexual phenomena of plants are invaluable to the student as illustrative of biological principles, and I would venture to say that the few lessons that are given on the structure of flowering plants and of seeds and fruits do not accomplish more than is required for the needs of any well educated man. But, as an introduction to the experimental methods of physiology, this part of biology provides, perhaps, the most useful assistance to medical education. Botany lends itself to this method more readily than zoology does, and there can be no doubt that the general preparation of the medical student for his second year studies would appreciably suffer if this part of his education were omitted.

The general sketch I have given in this address of the ideals we are endeavouring to attain in our course of biology indicates, I think, quite clearly that the six months, or in some cases a little more than six months, that is allotted to the preliminary science studies of the medical student cannot profitably be curtailed. I am aware of the perfectly justifiable demand that there is for more time to be devoted to the ever widening sciences of pathology and chemical physiology, for more time for clinical instruction in the wards, and for more time for special courses in medicine and surgery. The five years' study of a medical student is not enough to enable him to grasp all the branches of the tree of knowledge that it is desirable or even necessary for him to have in his hands as a qualified man. But if the period of study cannot be increased, and if the curriculum is to be reconstructed, I do most urgently plead that the scientific basis of the whole structure be not narrowed or constricted. The more the medical man has to learn, the wider his outlook becomes, the greater the burden of knowledge and experience he has to bear, the more reliant will he be on both the spirit and the substance which he has acquired in his scientific training during the first year.

II.—ANATOMY.

BY

ARTHUR KEITH, F.R.S., M.D., F.R.C.S.,

Conservator of Museum and Hunterian Professor, Royal College of Surgeons of England.

Is there really anything radically wrong—something which cries out for instant amendment in our modern system of medical education? If there is anything seriously amiss, is it not a strange fact that no complaint comes from the individuals most concerned—medical students, newly fledged graduates who are facing the difficulties of practice for the first time, nor even from the great public? It is from the teachers, not from the taught, that the cry for reformation emanates. The fifteen specialists who make up a teaching medical staff complain because a young brain cannot absorb in five years the extent of knowledge and ripeness of judgement which they have mastered in a collective period of three hundred years. The physician, the surgeon, the obstetrician, the eye surgeon, the ear surgeon, the skin physician, the neurologist, the orthopaedic surgeon, the pathologist, the bacteriologist, the pharmacologist, the teacher of hygiene, the physiologist, the biochemist, and the anatomist, match their several repertories of knowledge with that of the candidate for qualification and hold up their hands aghast at the result of the comparison. My sympathies are entirely with the single head which is expected to hold so much. The problem we have to face in this year of grace 1920 is not how to improve the education of the medical student but how we are to educate and reform his teachers.

You may say: get rid of specialization; pick your professors from the best equipped general practitioners. You cannot do that without arresting the progress of medicine; every profitable step forwards we have ever been able to take we owe to men who have specialized in some department of knowledge. Without specialization there can be no progress. No man is fit to profess or teach any branch of knowledge unless he has a first-hand experience of his special branch, and is not only capable of adding to its stock of knowledge, but of showing his pupils how improvements can be wrought. The medical teacher must be a specialist, and no measure that we can take will prevent the increase of specialism as time goes on. The specialist teacher we must have, but we must also have the general practitioner. I cannot foresee a time when less than ninety out of every hundred of medical men must be able to recognize and treat every one of the bodily ailments which afflict mankind. The real problem we have to solve is how a staff of specialist teachers is to produce an army of effective medical practitioners.

Is it too much to expect every medical teacher to keep his professional knowledge in such a state that, if called upon, he could resume or assume the rôle of general practitioner? I do not think it is. That is and can be the only guide a teacher has as to what he must expect his pupils to know. Whether it has been my fortune or misfortune I will not attempt to decide, but I have always been so situated that it might have been necessary for me to take up general practice as a means of livelihood; there was no financial sacrifice in that condition, for, like most of my teaching colleagues, I stood to gain rather than to lose by an exchange. I believe I have gained in every way in keeping up my knowledge of general medicine, and I care not who he may be—the teacher who does not keep himself in touch with his profession handicaps himself as well as those entrusted to him as pupils. With a reformation in the medical teacher of this kind we should probably hear less of that failing of the distinguished specialist whose vision is limited to his own speciality—be it physiology or surgery. In short, I hold that no man is fit to teach medical students unless he himself is a qualified practitioner and maintains his knowledge in a state which would permit him to ply his real vocation. If there is to be a compulsory training for the medical practitioner why not also a compulsory training for the medical teacher? Is it too much to expect that he should be able to scrape a bare pass in the examination papers which his colleagues set for students? At great medical schools every teaching anatomist and physiologist should have to hold occasional clinical appointments up to their 35th year.

There is another matter which lies close to the core of all our difficulties concerning medical education. It is this: Every teacher is, or at least should be, a researcher. He wishes to devote his energies in all his years, but particularly his earlier ones, to his chosen subject. His legitimate ambition is to raise a school of research students. His department is run for the increase and improvement of his own particular branch of knowledge. And yet I think most teachers will agree that in a class of 100 students there may be one—not likely more than one—promising recruit, and yet it is for the needs of the one and not of the ninety-nine that the department is run. This is a narrow, and I think mistaken, outlook on the part of many of our most distinguished teachers. If the teacher applies himself to meet the needs of the ninety-nine who are to practise medicine generally or some special department, he will not fail to waken the latent qualities of the promising research student. For the qualities which make a student an instrument of research cannot be bred in him if they have not been born in him. Here, again, I say the need of reform lies with the teacher.

One other matter which needs reform is the scope of our textbooks. There was a time when a student's textbook could be a complete repository of all the known facts relating to any particular subject. It was an encyclopaedia to which teachers and taught referred if they desired to ascertain the extent of knowledge on any particular subject. Our standard textbooks still strive to serve as works of reference for the research as well as for the pass student. The time has come when a clear distinction must be drawn between the student's textbook and the work of reference. As time goes on the difference between them must become greater and greater. The greatest sinners in this respect are the anatomists and physiologists; their textbooks could be reduced by half, with an improvement in the education of the man who is to practise general medicine.

What, then, are the essentials which must be mastered by the student before he passes into practice? No one can answer this question who has not watched a general practitioner make his diagnosis, apply his treatment, and watch the result in a hundred consecutive cases. I will not ask how far the practitioner does draw on the stock of knowledge learned while studying zoology, botany, physics, and inorganic chemistry as subjects preliminary to medicine. He probably puts into practice not a single idea or fact gained in his preliminary studies. Would I, then, exclude these subjects as unfit and improper for medical students? By no means! For the man who is to become a master workman in medicine, or for one who is to advance medicine in any way they are all of them necessary and invaluable, but they are not essential for the training of a highly qualified medical practitioner. They are for him matters of general education. The proper place of all these subjects is in the science, not in the medical, faculty of a university. How much of anatomy and physiology does the practitioner use? Let me speak of anatomy only. In seven cases out of ten he cannot make a diagnosis unless he knows the exact situation and action of the multitude of parts which make up the human body. But when we turn to our textbooks of anatomy we find that less than half of their pages is devoted to a study of the action and uses of parts. It was not so in our earlier textbooks; they were keys to the living body. Now textbooks are masses of description. Our examination papers are a wearisome repetition of "describe" this and "describe" that, as if a student could apply pure description in practice, or obtain any assistance from it in the diagnosis, treatment, or prevention of disease. Here again the reform must lie with the teachers. Anatomy could be made a living practical part of medicine if only the teacher would ask himself: Could this fact help me in diagnosis and treatment? If not, let that fact repose in the comfortable storage of his works of reference until it has proved its right to enter the currency of applied or applicable knowledge.

III.—PHYSICS.

BY

Professor Sir E. RUTHERFORD, D.Sc., F.R.S.

I THINK all will agree that it is in the best interests of the medical profession that as large a proportion as possible of medical students should receive a sound training of honours standard in pure science before or during their more professional studies. Such a training in pure science seems to me to be indispensable for men who are to become the researchers and teachers of the future; for without a firm grasp of the essential principles which underlie the applications of science to medicine it will prove increasingly difficult to make progress in investigation, and to uphold the prestige of our country as a centre of medical research.

In several of the Universities, and notably in Oxford and Cambridge, the abler students are advised to take a degree in pure science before or during their professional studies, and there can be no doubt of the great advantage to the profession to have a regular supply of able men whose training in science has been sufficiently broad and deep to take full advantage of the subsequent teaching. In the future there will be an increasing demand for such men, both for medical teaching and research, and it is of the highest importance that the Universities should offer every facility to the medical student to obtain such a pure science training with a minimum waste of time and energy.

Such a preliminary training adds at least a year to the length of the course for the final professional degree, and this is a serious question in many cases from the financial as well as the time point of view. The importance of encouraging young men of ability to take their degree in pure science seems to me so great that it would be well to consider the possibility of assisting them financially in cases where this is a pressing need. In my opinion, the attention of all Universities should be drawn to the need of encouraging and assisting young men and women of talent to take a university degree in Science before their professional course. I am confident that the medical service and the State would gain a rich return for the additional work and expense involved.

The above remarks are meant to apply mainly to a relatively small group of able men and women who may be expected to be leaders in their profession, but it is not feasible for various reasons to expect the great majority of medical students to follow such a course. In the remarks that follow I shall deal mainly with the pressing question of the scientific education of the *average* medical student leading up to the first M.B. It is, I think, the general opinion among those who have to do with the teaching of medical students in our Universities for the first M.B. that the existing state of affairs is highly unsatisfactory and calls for drastic changes. A large fraction of the students entering the medical course to-day have received little or no scientific training in the schools, and in the course of two or three short terms in the University cannot hope to acquire more than a mere smattering of the elements of Physics, Chemistry, and Biology. In

addition, there is the tendency of the student to regard their pure science work as of relatively little importance compared with their professional studies. As a consequence a large fraction of the students just manage to scrape through the very elementary qualifying examination, and it is on this foundation of sand that the edifice of medical instruction has to be reared. If Medicine is to be regarded as a scientific profession, it seems to me imperative that the student should acquire a much broader and clearer knowledge of the fundamental methods and principles of science than he gains to-day. This is at a time, too, when some of the medical profession, in order to gain room for the more professional subjects, seek to reduce the time, if not to reduce the standard, for the first M.B.

The best method of dealing with the present unsatisfactory situation seems to me to require a preliminary knowledge of science, and particularly of Physics and Chemistry, before admission as a medical student. This preliminary training can best be given in our Schools, where, instead of being concentrated in a brief course, two years or so may be devoted to gaining a sound knowledge of some branches of Physics and Chemistry. The element of time is, to my mind, of great importance in gaining a grasp of scientific principles, and for this the present University training is much too concentrated.

I do not think it desirable that the Schools should attempt to prepare students directly for the first M.B. examination, for in such a case the present state of affairs is likely to grow worse instead of better. There will be an inevitable tendency in many schools to cram the boys to ensure their success in the examination, and we cannot be sure that the necessary broad training in the fundamental principles will be given. The time of the schools could be fully occupied in giving sound instruction in the elements of Mechanics, Heat, Sound, and Light, with possibly a beginning in Electricity and Magnetism. In particular it is highly important that the elements of mechanics should be properly taught both in the classroom and in the laboratory.

On admission of the student to the University he would have had a sufficient preliminary training to take full advantage of the university instruction. This teaching should preferably be given by a man of high scientific standing with some knowledge of, and interest in, the application of Physics to Medicine. The course should not be a repetition of the subjects taught at school but devoted mainly to a consideration of the properties of Matter, Electricity and Magnetism, and possibly a consideration of the theory and use of optical instruments employed in the medical profession. Under properties of matter, special attention should be directed to subjects like surface tension, diffusion, osmosis, etc., which are of special importance in physiological processes. A sound knowledge of the elements of Electricity seems to me essential, for not only is it of direct practical importance in several branches of the profession, but electrical ideas tend to become of increasing importance in the explanation of underlying phenomena. The aims of this course would be not to require a knowledge of a multitude of facts but to give the student a clear understanding of the fundamental ideas of the subject and of their application in Medicine.

It is of importance that a course of this kind should be given by a teacher of standing; the lectures should be illustrated as fully as possible by experiments and every endeavour made to excite the interest if not the enthusiasm of the student in the subjects that are treated. By a combination of the Schools and the Universities along the general lines that have been indicated I think it would be possible to ensure that the average medical student gains a clear idea of the essential principles of science. If a similar course were followed in Chemistry, I am confident that we would soon see a substantial improvement in the standard of the student for the first M.B.

This would at once help to improve the efficiency of the medical teaching—for example, in Physiology—and in this way we may hope to turn out a better qualified and more scientific product than is the case at present.

What I have said above refers particularly to Physics and Chemistry. The case of Biology is somewhat different, for it presupposes a reasonable knowledge of Physics and Chemistry. It is not likely that our schools would be capable for some time to come to provide good instruction in all these subjects. It may be desirable for these reasons that the Biology for the first M.B. should be taught by the Universities as at present.

As regards Physics, it may ultimately prove desirable to give in addition a short course of Medical Physics at a later period of the medical curriculum—for example, in the third year. At this stage, the student is in a better position to realize the importance of Physics in his more professional studies, and is likely to regard the subject more seriously than in his first year. Such a course would be analogous in some respects to the course of Biochemistry which is given to medical students in Cambridge in their third year.

In the suggestions outlined in this paper, it may appear to some that I have been unduly insistent on the necessity of a sound training in the fundamentals of science. I am sure, however, that all those who have reflected on this subject and have the interests of their profession at heart will agree that this is a prime necessity if we hope to raise the standard of the profession. Much can be done if the medical teaching is reared on a sound basis of scientific principle, but without it the energy and enthusiasm of the medical teacher is largely wasted.

IV.—THE RELATION OF THE PRELIMINARY SCIENCE TEACHING TO PATHOLOGY IN THE MEDICAL CURRICULUM.

BY

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THE relation of the training in preliminary science to that required in pathology in the medical curriculum is of interest because pathology is in many respects a bridge between the earlier and the later stages.

Pathology is anatomical and physiological: it deals with structure and function: in its purview the whole field of abnormalities is included. Without physics and chemistry the development of pathology would be practically impossible. To them the pathologist must resort when he would obtain conceptions and methods for the accurate measurement of living processes. To measure chemical or physical change in the organism is the first step towards a scientific interpretation of the living process.

The student who would become trained in pathology must therefore have a complete knowledge of the elementary principles of physics and chemistry. These sciences serve as an introduction to the whole curriculum, and the courses in these subjects should familiarize the student with fundamental laws and principles on which the whole structure of experimental science is built. The subjects which are taken up during the preliminary period are the foundation for all the later work. It is hopeless to escape from empiricism in medical teaching and practice if we do not take the precaution of beginning the course by a study of physics and chemistry. In the demand for a clear and sufficient introduction to fundamental scientific ideas pathology merely emphasizes the claim which is made by all other branches of medicine.

The courses in chemistry and physics may well be overtaken to some extent at school, and therefore prior to the medical curriculum. But however we may deal with the general elementary introduction to science, there must remain in the curriculum the chemistry and physics which have direct relation to medicine. This form of chemistry and physics cannot be described as preliminary science. It is the detailed and special study of chemical and physical changes in the substances which are found in relation to metabolism. Physiology, pathology, pharmacology, medicine—each and all constantly require on the part of the student detailed knowledge of the intimate chemistry of metabolism.

Hitherto it has been the practice of the medical schools to include in the courses of physiology, pathology, etc., the chemical instruction required by the particular subject. Recently, however, the plan has been introduced in various schools of giving courses in biochemistry which deal with these problems from the point of view of the chemist. Such courses are valued especially because they give instruction in these metabolic processes in their relation to general chemistry. This the biochemist can teach with a freedom and impressiveness which are of great value in conveying knowledge to the student, and the task of giving

instruction of this type is handed over to the biochemist by his grateful colleagues. It is true that it is not the chemical process in itself that is the chief interest to the student of medicine, but the chemical process in relation to the activity of the organ concerned in its production. To take an example: the relation to each other of the various substances which appear in the breaking down of molecules of fat is at the same time a chemical problem and a problem in the physiology of nutrition. Chemical knowledge of the process is the basis on which the study of the process of nutrition rests. It is therefore a natural and appropriate subject for the chemical course, and yet it is doubtful if it can be successfully taught in the preliminary period of the curriculum. It is better that the problems of physiological and pathological chemistry should be taught in relation to the courses of physiology and pathology. It is difficult for the student to realize the bearing of the chemical teaching until he has become familiar with the process in the body, for the understanding of which such knowledge is required. To study the process and its chemistry together is the ideal which we should attempt to reach. Hence we should continue the study of chemistry throughout the curriculum. It should at the beginning have place as a preliminary science; but it should continue to be studied in the later years in its application to the interpretation of normal and abnormal organic processes.

How much chemistry should be taught is a question naturally raised at this point. The end to be kept in view is defined by what I have already said. The chemistry of the introductory period, inorganic and organic, must be continuous with and preparatory to all that is required later to understand the teaching of the biochemist when he deals with the chemical changes in metabolism. It would, indeed, seem natural therefore that the direction of the whole teaching should be in the hands of the biochemist. He should begin in the first year by supplementing, if necessary, the general chemical teaching which the students have received at school, and he should extend the work into the sections of organic chemistry and biochemistry which deal with the physiology and pathology of metabolism. It will be necessary for a chemist with such wide responsibility to continue his teaching through several, and possibly through all, the five years of the curriculum. By the unity and continuity of chemical study which would be secured by such an arrangement the student would acquire at each stage the capacity to apply chemical methods of study and interpretation.

A similar arrangement would form an equally appropriate method in the instruction to be given in physics. The argument need not be repeated in detail. An introduction to general elementary physics should be given, and this may be obtained wholly or partly in school before entry on the medical curriculum. As the curriculum proceeds in physiology, pathology, general surgery, the special surgery of the eye, the ear, the application of physical methods in medicine, there arises the necessity for special teaching in light, sound, electricity, heat, x rays, radio-activity, etc. As in the case of chemistry, the teaching of physics in relation to the organism is of interest to the student of medicine primarily because of the organic process with which the physical change is associated; but just as we do not propose to leave the teaching of biochemistry to the physiologist, pathologist, physician, and surgeon, so we should commit the teaching of physics to a biophysicist. Unity and continuity is required as in chemistry. In neither case should there be by this arrangement any additional burden placed on the student. The greatest burden which is put upon him by the present curriculum is that of useless knowledge. Time is wasted if spent on studies the interest of which is allowed to lapse at the end of a particular course or after passing a particular examination.

The extended teaching which I have proposed would go far to prevent the neglect of the fundamental sciences which takes place under the more haphazard arrangements now in existence. The teachers responsible for the whole course would easily realize what is required at each stage of the curriculum.

The same argument applies, and with still more force, to the study of biology. Pathology, like other branches of medicine, is a form of applied biology. We are too apt to think of animal biology in a restricted sense, as the science of the normal organism. The science has developed its teaching chiefly in the form of morphological description of structure. It is the anatomical or morphological comparison of various types of animal structure that has constituted a large part of the teaching of animal biology. This forms the introduction to animal biology for the medical student. The normal human organism is studied in detail in the courses of human anatomy and physiology, and it is on a basis of the knowledge gathered in these three courses that the student begins his study of pathology.

In the study of disease the student has to learn the meaning of abnormal structure and function, and in this he has to work out conceptions which the study of the normal may not have brought into prominence. The development of the organism is studied in normal embryology; but in pathology this becomes the basis and the exposition of congenital disease and maldevelopment. To work out the meaning of maldevelopment we have to make use of the laws of heredity and the transmission of structural or functional characters from parent to offspring, and behind the history of the organism and the history of its structural and functional inheritance lies the problem of growth—the nature of growth and the regulation of it as it is seen in cell growth, organ growth, the growth of the body as a whole. In pathological processes in the body growth is disturbed. Sometimes it is diminished, at other times it is excessive; often the growth which results from pathological conditions is partly beneficial and partly harmful. We have to deal with growth associated with pathological irritants—growth associated with hypertrophy in gland or muscle where there is call for increased work; growth which is of the nature of tumour and which assumes a variety of uncontrolled forms partaking of malignancy and revealing absence of the ordinary regulative factors. Disease may be said in general to lead to destruction and disorganization of the tissues which it attacks. The disorganization may be followed by recovery, in the stages of which the disturbed structure is reorganized or restored more or less completely. To follow the process of destruction or recovery much important study must be directed to the nexus of the various organs with each other in the unity of life.

The margin of function and structure which each organ provides beyond that which is demanded by the bare necessity of bodily activity provides the field within which disease works. When this margin is cut down a point is reached at which the liver or the kidney or the lung or some other organ becomes inadequate for the continuance of life, even in the imperfect and limited forms which we may observe in the stages of chronic disease.

Enough has been said to show that the study of disease cannot be taken far without involving the application of biology and the demand for biological investigation. To interpret the functional value of diseased organs requires constant reference to the structural and functional development of the body. Pathological problems are, in a sense, highly specialized, but again we can escape from empiricism in dealing with them only when we give them shape by relating them to general biology and the general study of the development and organization of the body, and of the origin and correlation of the various organs of which the body is composed.

Pathology will be strengthened and simplified in its teaching if the biologist who gave the students their introduction to the general science also continues the teaching in relation to fundamental problems of pathology.

In general my plea is that the present curriculum is wasteful of the students' time because it gives what may be called a general introduction to the sciences but leaves it to the later teachers or the students themselves to apply the principles and methods of these sciences in the various branches of medicine. Whereas a continuity of teaching would concentrate intellectual effort and would thereby attain with much more certainty the standard of work which the curriculum is designed to reach. We must also remember that the student of medicine should be trained in criticism, and for this all-important part of his training the earlier sciences must assume a considerable part of the responsibility. To be a good practitioner of medicine requires that the doctor must possess not only technical knowledge and skill but also a broad, sympathetic, tolerant conception of life. To secure this nothing could be better than critical reflection on the fundamental conceptions by which the phenomena of life are interpreted.

V.—CHEMISTRY.

BY
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IT is natural for anyone who is seriously engaged in teaching chemistry to medical students to ask himself repeatedly what is really required of him by the interests, if not by the desires, of his pupils, and by the considered judgement of the leaders of the profession. If to-day we who are concerned with the physical sciences look round medicine and compare the state of things with that which the older among us can easily remember, we cannot fail to be struck by the greatly increased number and importance of the applications which are now being made of physics and chemistry to advance the art of healing. Modern physiology alone has been brought to such a condition that for its full comprehension a really sound and substantial knowledge of chemistry of university standard is quite indispensable. Much the same might be said of other branches of medical study. If all the apparent claims had to be satisfied a very strong case could be made out for increasing the time that a medical student should spend in a preliminary study of what we call the pure sciences.

But the matter must be viewed from another standpoint. There is the curriculum to consider, with its ever-increasing burdens and competing claims, and there is also the actual practice of the art. The scope of medicine is indeed so vast that there must always be at the end of a student's curriculum many things left unlearnt, which, had time and opportunity allowed of their acquisition, would have been all for his good. We must therefore agree upon a less allowance than we could desire, and the question really is not how much can you teach that will be useful, but what is the least that is indispensable.

Some chemistry, everyone agrees, is quite indispensable for the medical man. The crudest facts of the science, such as the difference between acids and alkalis, the general character, method of preparation and nomenclature of a variety of salts and of a few organic compounds, a little knowledge of chemical formulae, chemical testing, the bare outline of quantitative analysis—this sort of thing, which is as necessary to a medical student entering upon the territory of physiology, pathology and the pharmacopoeia, as a few phrases are to a traveller entering a foreign country, everyone agrees is indispensable. It can be picked up very quickly by anyone of moderate intelligence, just as the foreign phrases can; it is not of necessity a serious mental exercise or intellectual outfit, and it would seem to be a matter of little importance when or where it was acquired.

The teaching of chemistry conceived in this spirit is, I need hardly say, not very exhilarating either to teachers or students, but I am afraid it has largely prevailed. Some of us, perhaps most of us, have tried to do more—have tried to give something of the philosophy of our subject, to exhibit the power of scientific method, to instil some powers of chemical thinking. But we are apt to create alarm when we plead for more consideration for our subject.

I must confess, at the end of thirty-five years, that no part of my teaching seems in retrospect more unsatisfactory than that which has been spent upon medical students, though I have always taken the task seriously, have been greatly interested in medical studies, and have had the most amicable relations with medical students. The root cause of dissatisfaction is a feeling that I have been trying to convey knowledge for which, speaking generally, there has been no real heart either among the students or in the profession. There has seemed to be a prevailing opinion among them that the study of preliminary science was a penalty rather than a privilege, something to get done with, an obstacle to be passed before you could enter upon the highway of true professional study, not a foundation to be well and truly laid, to be retained and built upon, not something to be assimilated and incorporated with succeeding knowledge.

I cannot think that the mere phrase-book knowledge of chemistry will be deemed enough of chemical science even by the most strict censor of excess, and it is certainly far from satisfying the declared aspirations of those who ultimately control the whole of medical education. They lay stress upon a sound knowledge of the basic principles of science, a proper grasp of scientific method, and an attitude of mind which will disclose itself in a scientific spirit permeating all subsequent studies. I think it must be admitted that we who have been teaching science in universities have failed very decidedly to achieve this end, and that somehow or another we have gone wrong. The little regard that our work has earned is shown by the deliberate act of the profession in affirming that all that we have done can now be perfectly well done at school. This means, of course, that we have neither specialized our teaching effectively towards medicine nor given it any intellectual weight which makes it the sort of thing that can only be reasonably expected from a university. It will be said, of course, that I am mistaken; that the recent changes are due, not to the fact that our teaching has been so bad but that the school teaching of science is now so good. Personally I do not accept this consolation, and I am determined to confess that we have been at fault, yet equally determined to maintain that what we should do no school can be expected to do for the scientific training of the medical student.

No doubt those who have been trying to teach chemistry to medical students have been afflicted by the difficulties that are common to a great deal of teaching. They have been afflicted by an examination system in which teaching has often been divorced from examining. A certain tract and type of chemical knowledge has been marked out, and has acquired a character of orthodoxy. A conventional syllabus has been erected and the subject has been scheduled, with the inevitable results. The teacher is put in bonds, and one way or another, irrespective of his own views and methods, must prepare the student for the prescribed test as applied by any appointed outside person. The examination becomes the goal, the syllabus the beaten track, and the spirit of true study takes flight. The teacher may take infinite pains to be interesting, to exhibit the sway and power of scientific method, to whet the appetite by the great records of discovery, to show the junction of chemical science with physiology and hygiene and its participation in the progress of medicine, to instil some powers of scientific thinking; but no! here is the examination syllabus, last year's papers, and a little book by some examination expert, or here for the most desperate case is the crammer. Attend to these things, contrive not to disappoint the examiner of more than 50 or 60 per cent. of his professed expectations, and you will soon have done with science and can get to business. That, I think, is not an unfair view of the state of things which has largely prevailed.

I have sought again and again for a better way of engaging the interest of medical students in chemistry. I adhered for a long time to the belief that the conventional subject, if only properly presented, should secure their interest; but I think we professional teachers are very apt to go wrong by attributing to the average student the same sort of capacity for interest in abstract studies as we ourselves, by our very nature, possess. We are apt to suppose because we know how important are our wares, and how profoundly and enduringly our philosophy may benefit our students, that they will take what we offer on faith; whereas, as a matter of fact, the average student, with the career of a specialist in view, very naturally wants some very clear and direct evidence that what is claiming his time and attention is really to the point, and not merely something imposed by a sort of academic tradition.

Some years ago I decided to separate the medical students from others taking the elementary course of chemistry, with the object of altering the substance and form of the teaching as far as seemed legitimate towards bringing it into closer relation with matters of special concern to the student of medicine. The advantage was at once evident, but I have to confess to the great difficulty which I and my colleagues have experienced in detaching ourselves from the ancient conventions, in eliminating the really superfluous substance of the old established courses, both on the theoretical and practical sides, and in making time for a better study of the principles of chemistry in relation to topics of obvious interest and importance to this particular set of students. I think it remarkable that in those universities where the teachers are their own masters so far as examining is concerned, and where they are practically free to go their own way, so little has been done to introduce a directional element into the

preliminary scientific studies of medical students. Happily there is now evidence of a considerable change. The simple truth is becoming more realized throughout all education that if you cannot interest you cannot teach; and another truth, not so simple and not so generally acknowledged, is being acted upon, namely, that it is both possible and legitimate to invest even elementary teaching with a topical character. I believe that it is by moving in this direction that we can make more of the chemistry in the medical curriculum, and I do not yet despair of seeing a course which will not appear to stand separated by a barrier from real professional studies, but will be welded to them in a way that will be sufficiently obvious to the student to engage more fully both his interest and his understanding. It is noteworthy that the University of Edinburgh has lately established a Chair of Chemistry in the interest of students of medicine. Professor Barger, who occupies the chair, has explained to me the general lines on which he is proceeding. If he is not here to speak for himself I shall read his letter, for it indicates, better than any words of mine could do, the kind of solution towards which I have been moving, and it gives promise of a development which I believe to be of the first importance.

Department of Medical Chemistry,
University of Edinburgh,
May 31st, 1920.

Dear Professor Smithells,

It is proposed that I should ultimately have under my control (directly or indirectly) the whole of the chemical teaching of medical students, including physiological and clinical chemistry, but for the present I am teaching only inorganic and organic chemistry to first year students and giving occasional more advanced lectures on special subjects. No previous knowledge of the subject is at present required from students entering my class, but in October, 1921, a new regulation comes into force which will demand from students coming to me an elementary knowledge of inorganic chemistry, at least up to the standard of the London Matriculation. This will enable me to raise the standard, in spite of the limited time given to the subject, and the provision of new laboratory accommodation will make possible a much needed reorganization of the practical work by substituting simple organic experiments for some of the qualitative analysis.

I lecture to first year students five days a week for forty-five minutes during twenty weeks from October to March. The students spend each week two periods of two hours in the laboratory, and hence devote 20 ($5\times2\times2$) = 180 hours to chemistry, with perhaps an average of one hour per day for private reading: total something like 300 hours. Most of their time during the winter is taken up by anatomy lectures and dissections, and they also do a *little* physics. Obviously it is not possible to do much in the time allotted to chemistry; at present I deal with oxygen, hydrogen, nitrogen, and carbon, and after about five weeks begin organic chemistry with three lectures per week, leaving two for inorganic. The total time given to organic chemistry is therefore nearly half. I have not found it possible to deal to any extent with physical chemistry, but in 1921 I hope to develop this by way of revising the inorganic chemistry taught in schools.

In my opinion it is most important to face realities and to have no illusions: before taking his degree the average medical student forgets most of the chemistry he learns in his first year. Of this I have convinced myself by (voluntary) oral examinations of fifth year students. The "half life period" of their chemical knowledge is perhaps one year. Hence I lay great stress on general principles, but mention little detail. In organic chemistry I insist very much on structural formulae, making the most of the quadrivalency of carbon, the trivalency of nitrogen, etc. I find they are sometimes inclined to think of acetic acid as $C_2H_4O_2$, but I insist that it is a methyl group joined to a carboxyl, methyl formic acid or carboxy methane, CH_3COOH (and hence $C_2H_4O_2$ only if they like to add up). A further circumstance compensating for the shortage of time is the fact that I lecture to medical students *only*. I can therefore afford to omit such things as the metallurgy of copper, and can illustrate general principles by examples of medical importance. For instance, after showing the catalytic action of manganese dioxide in the preparation of oxygen, I at once mention enzymes and later show side by side the decomposition of hydrogen peroxide by means of finely divided silver and by blood. My main concern is to make a basis for physiology, and hence I do the fats, carbohydrates, and something of the proteins pretty thoroughly, but say little about benzene compounds. I believe that hitherto organic chemistry for medical students has been taught too much with reference to synthetic drugs and too little as a groundwork for physiological chemistry. It is very important to make the best choice of the few things one can teach, and I believe that as physiology is the basis of medicine, an elementary knowledge of the chemistry of the proteins is of more importance than the preparation of salicylic acid or chloroform. In inorganic chemistry I teach only such simple quantitative estimations as the practitioner can do himself.

Now and then I make a slight departure from this very utilitarian programme in referring, for instance, to the carbon and nitrogen cycle in nature, the chemistry of photography, and a few other things of general interest. The interest of the students is at once aroused when they grasp that they are being taught with a view to their later professional studies, and they always respond to efforts to help them in this direction.

Yours very truly,
GEORGE BARGER.

It is certainly most desirable that medical students should be taught some chemistry at school. It is extremely difficult to do anything effective in a single year with students brought to the university at the age of 17 or 18 with not even a rudimentary knowledge of scientific facts and with their scientific faculty almost atrophied. In the space of a single academic year you really cannot retrieve and redress the neglect of the whole period of youth and adolescence. A purely classical boy usually remains for long completely bewildered on taking up scientific studies, though in time he might make up lost ground quickly.

Many medical students now coming to us have been taught chemistry at school, and in recent times the science teaching in schools has improved remarkably. I should be sorry indeed to do any injustice to it, but I think a great deal of misunderstanding exists as to the actual state of things. It is still the case, for example, that the vast majority of medical students coming to the University of Leeds do not possess anything like the knowledge and grasp of chemistry which, so far as I can understand, is avowedly desired as a minimum by those who lay down the laws of medical study. A sound knowledge of elementary facts and elementary principles, the capacity to carry out neatly and intelligently simple practical exercises, is expected from school teaching, but even this is yet only achieved in a minority of the students with whom I have to deal, and I think that with the most moderate estimate of what is desirable for the medical student it will long remain the case that a year of university study must be provided.

I look upon the intensive study of science in school years with great distrust, based upon the painful experience of having had to deal much with students who arrive at the university in that worst possible plight of having a large mass of undigested knowledge and a feeling (which so far as facts are concerned may be largely warranted) that all you have to tell them they have heard before. I am certain that I have made more mistakes by putting new students to work which was really beyond their capacity than by constraining some unwilling ones to take a course which they deemed beneath their powers. There is, moreover, another thing which must be considered, namely, that a year in a university atmosphere, and even a first year course, given by a man whose whole mind and experience have been devoted to his science, ought to do something towards producing a maturity of thought, a breadth of scientific outlook, and a general intellectual stimulus that cannot easily be impressed on school boys in the environment of school. I am one of those who believe that beginners require most of all the influence of the most experienced teachers. There may seem some arrogance in making this kind of claim, and I have heard it derided. But I am content to be in the same camp with Sir Ernest Rutherford, who has expressed himself in the same sense, and with other teachers of great experience with whom I have discussed the subject.

Whilst I hold these views, I freely admit that if students coming from school are placed in the hands of a young and inexperienced teacher, and are taken perfunctorily through the routine that has been so long customary—if that is all we do, no complaint can be made on our part should it be thought fit to relegate the whole of the preliminary science teaching to the schools, to be made there as good as is possible within the obvious limitations.

It may be that some grouping of medical students and differentiation in the scientific course will become necessary, and that for a section of them the basic sciences will have to be restricted to a good deal less than the ideal. At the same time, for others a more thorough study of those sciences may be prescribed, and, by their combination with physiology and possibly other of the more professional studies, a science degree course may become normally an accompaniment, partly preceding and partly including what are now marked off as the medical studies proper.

Whatever is done in relation to the quantity of chemical teaching of medical students I am convinced that its

quality may be greatly improved. I do not think, judging from my intercourse with medical men, which I am glad to say has been extensive, that as a whole they would say that, apart from what I call the phrase-book knowledge, their chemistry had been much either of an inspiration or a tool. I do not think that they are often in possession of a live and available knowledge of even the fundamental principles of chemical science, and I know that many of them regret this in their inability to keep in satisfactory touch with the abundant and profoundly important discoveries now being made on the borderland of medicine and the exact sciences. So far as the discipline of science and the scientific attitude are concerned, it is of course admitted that these are not the monopoly of what are called the pure sciences. Teaching throughout the curriculum, imbued with a scientific spirit, must have a powerful formative influence on habits of mind. It is not on such general educational grounds that I would make any special or exclusive claim for chemistry. But I am confident that if within the time at our disposal we make the most of our opportunities, we can give the future medical man a better endowment of chemical knowledge and understanding that he will be glad to have and that he will be able to use to greater advantage—knowledge that will remain and be available for use with the same confidence at least as is felt in the case of a sound knowledge of grammar or arithmetic.

I feel that it is incumbent on us who are charged with the teaching to justify fully the retention of chemistry as an integral part of the university medical curriculum.

[Subsequent proceedings will be published in a later issue.]

SIR CLIFFORD ALLBUTT'S PORTRAIT.

PRESENTATION CEREMONY AT CAMBRIDGE.

AT the conclusion of the President's address the company adjourned to King's College, where a reception was held, and the portrait of the President was presented to him by Sir NORMAN MOORE, Bt., President of the Royal College of Physicians of London.

The portrait, by Sir William Orpen, R.A., was on view in King's College Hall.

Dr. J. A. MACDONALD, in calling upon Sir Norman Moore to present the portrait, said that it had been subscribed for by an immense number of members of the medical profession.

Sir NORMAN MOORE, in making the presentation, said it was his duty to present the very distinguished Regius Professor of Physic of Cambridge University with his own portrait. They had ascertained by direct observation how great was the man to whom they were going to give it. If they had not had the advantage of personal observation which they had enjoyed that day, and particularly in the Senate House that evening, they could ascertain that by comparing Sir Clifford with others who had been professors of physic at Cambridge, and see if he came up to the highest standard which they had attained. The professorship of physic in Cambridge University was founded about the year 1540, and the first man of great distinction to occupy the post was Ralph Winterton, a member of the College in which they were then assembled. The history of Ralph Winterton was interesting. He had been in the College for several years, and had tried many varieties of study—the Greek poets, theology (he translated into English Rexilius's *Eternity*), and so on, but in spite of that he fell into a deep melancholy. He consulted his friend, Dr. John Collins, who was then Regius Professor of Physic, and Dr. Collins told him he needed a change of occupation, and suggested the study of medicine. Ralph Winterton took that advice, and after a short time produced a book on medicine; it received a large amount of praise from competent critics. It indicated the change in taste which had taken place since that time when he said that Sir Clifford Allbutt had also published a book—his celebrated *System of Medicine*, in eleven volumes. His predecessor's—Ralph-Winterton's—book was a translation of the aphorisms of Hippocrates into Greek verse. (Laughter.) That received the commendation, in Latin verse, of twenty Fellows of King's College. It received praise in Latin, Greek, and Hebrew. Sir Norman Moore went on to speak of Winterton's successor, Francis Glisson, who succeeded to the professorship in 1636, and was the author of the book on the anatomy of the liver which had caused Glisson's name to be known to every medical student and practitioner in all European countries. After describing these and other occupants of the Chair, Sir Norman Moore said that he had tried, with the greatest difficulty, to give them the opportunity of comparing Sir Clifford Allbutt with these earlier professors, and they would agree that Sir Clifford was deserving of a place in the very front rank, and side by side with the great ones of the past. He had been a devoted servant of the profession of medicine. In the midst of hard professional work he had not hesitated to turn aside to give such lectures as those he gave to the Royal College of Physicians on Greek and Roman medicine. He had never spared himself if he could add to the knowledge of medicine, or stimulate anybody else to add to that knowledge. Dr. Macdonald had explained how the portrait had been subscribed. It was not the product of a particular Association, however distinguished, or a particular College or set of men. It was the gift of the whole medical profession. Supposing Sir Clifford Allbutt had been living in the time of Rembrandt, Rembrandt would have been employed to paint him. Rembrandt had passed away, so far as any man could pass away who had left behind such records of his art. But, Rembrandt not being available, they got the best portrait painter of men who was to be found in our time. Sir William Orpen had executed the portrait with great skill, and he (Sir Norman Moore) had great pleasure in presenting it, in the name of the subscribers, to its subject.

Sir CLIFFORD ALLBUTT, in receiving the portrait, said that for some while past he had been wondering in his rather perplexed mind how he could put into any form of words the thankfulness that he felt for the kindness he had received that evening. They had just done him great honour in the Senate House, and now they were doing still more to set him upon what he might call the summit of a very long and happy life. When the Treasurer, Dr. Haslip, always his kind friend, got up in Council and proposed that his portrait should be presented to him by the profession in general—not merely by the Association—he was surprised and rather startled. But he was a little encouraged by the reception which was given to the idea in the Council itself, and afterwards he was overwhelmed by the way in which it was received by the profession outside. When he came to read the list of names of the subscribers, and saw in the list some of his devoted friends for many years, and also the names of a great many people whom he had never met in the world, he became more and more perplexed to accommodate his own reckoning to theirs. He was not going beyond his brief if he accepted this gift—which was given to them for their home—in his wife's name as well as in his own; and on the part of both Lady Allbutt and himself he wanted to thank them all.

British Medical Journal.

SATURDAY, JULY 3RD, 1920.

THE PRESIDENTIAL ADDRESS.

THE circumstances in which the British Medical Association resumes its annual meetings for scientific discussion could hardly be more fortunate. After an interval of six years necessitated by the war it meets in one of the two older universities in England—a home of learning and peace—and one that in the forty years since it last entertained the Association has exerted the greatest influence on the progress of medical science. Not only is the Association happy in its place, but exceptionally so in its President, who, though the doyen of British medicine, has the mental elasticity that comes of constant touch with the young and active. His experience as President of the Association is also unique, for he has held office since 1914, and gave the address at the Clinical Meeting of the Association in London last year.

As he annotates in his characteristically charming address the events of current medicine the President firmly impresses certain guiding principles, and points the way by imagination—that most desirable trait in a medical leader—to further fields of work. After rapidly sketching the origin of universities, he naturally, and with a graceful but hardly necessary apology for turning to his last, discusses the influence of university education on the professions, and especially on medicine. A university is not merely a technical college; it should first mould the student's character and give him a training in clear thinking, and then impart particular knowledge and experience. Just as some forty years ago the Regius Professor of Medicine at Oxford, Sir Henry Acland, threw out a wise warning against early specialization, so now, when the danger is more urgent, the Regius Professor at Cambridge denounces narrow specialization as a mark of narrow culture among primitive nations. Again like Sir Henry Acland, he is opposed, on the grounds of insufficient clinical material, to the establishment of a complete medical school at Cambridge, but points out that much good can be done by linking up the various parts of the curriculum; for example, normal can be usefully correlated with disordered function by showing patients, say, with dropsy or visceral disease, to students in the course of their physiological, biochemical, or pharmacological studies.

Much indeed as Medicine owes to other sciences, the debt is not all on one side, and this address shows how the needs of practical medicine have stimulated scientific research, and thus opened up paths of investigation which might otherwise have long remained unexplored. A high value is placed on the graduation thesis as a means of education, especially as a stimulus to independent thought and action; in fact to allow graduation to a candidate who has not prepared for it a work of original research is unworthy of a university. This may seem a hard saying, but it is at any rate the result of experience, which the young don also, if tradition be true, hailing from Cambridge, was pleased to call "that greatly overrated property."

The much worn and therefore difficult subject of research is treated with a light but sure touch, and the scope and applications of its two main branches—that of natural observation and that of artificial experiment—are picturesquely defined. In connexion with the observational method the Regius Professor first has a playful dig at his surgical colleagues of the past and then pays a generous tribute to Sir James Mackenzie's work both in the past and now at the St. Andrews Institute; incidentally he recalls to our minds the efforts of the Collective Investigation Committee, founded by the late Sir George Humphry, his predecessor in the presidential chair at the Cambridge meeting in 1880, and while referring to the reasons for its want of success shows a sympathetic knowledge of the difficulties inherent in this form of research. In making a vigorous appeal for the further recognition of comparative pathology he rather ruefully points to Sir James Paget's address on this subject forty years ago and to his own remarks in his address in medicine to the annual meeting (1888) in Glasgow, as the voices of those crying in the wilderness, and to their failure to attract the help, so obviously needed, for the establishment of an Institute of Comparative Pathology which at a relatively small initial cost might curtail or prevent the heavy yearly loss from the destruction wrought by insects in forestry and agriculture. In his address to the Section of Medical Education Sir George Newman (p. 11) makes the same plea, but from a slightly different point of view—that of the sounder training of the medical student in biology, of which, as he truly says, medicine is a part.

The President's rather stern comments on psychoanalysis and its practice recall his sane and satirical strictures on the vagaries of gynaecologists in his Goulstonian lectures of 1884 on the visceral neuroses; coming from one with a broad outlook that is ever on the alert to utilize the germ of good in any new form of treatment, they must arrest the attention of the medical profession.

His remarks on the doubtful future of general practice in this country and on the changes that he has watched during his professional lifetime will be read with interest. The scheme of "group-medicine" now springing up in the United States of America, which he describes with approval, is probably inspired largely by the phenomenal success of the Mayo clinic, but it is a logical outcome in an organized form of the widely recognized need for team work. It is probable that some similar method will eventually be tried in this country. The advantages are fairly obvious, but the method is attended by difficulties and pitfalls of its own. Its commercial aspects, and its effect on the financial interests of the profession at large, will require the most careful consideration.

In conclusion it is a matter for regret that the President should modestly have suppressed his remarks on the future of voluntary hospitals and that he has denied the profession any detailed criticism of the recent report of the Consultative Council.

ANIMAL AND PLANT PATHOLOGY.

IN his address the President recurred to a subject to which he had called the attention of the Association over thirty years ago. His appeal to pathologists to make their field of study as wide as possible, embracing not only animals other than man,[1] but plants, will be read at page 5, and opinion to-day is perhaps more ready to accept its

[1] It is worthy of note that Sir Henry Acland, when addressing the Section of Public Health at the meeting of the Association in Cambridge in 1880, said that his conviction that the study of the pathology of domestic animals could not be separated from that of man had led him to advocate the foundation in the University of Oxford of a chair in general and comparative pathology.

force than when Sir James Paget delivered the address to the Pathological Section at the meeting of the British Medical Association at Cambridge in 1880.[2] That address was entitled "Elemental Pathology," and was marked by the width and depth of thought and the suavity of manner characteristic of him. He began by saying that every pathologist must have felt that the greatest difficulty in his study was in the manifold complexity of the body in which it is pursued. After dwelling on this a little he went on to say: "I have long and often felt that, in these difficulties, we might gain help from studying the consequences of injury and disease in the structure of plants. For although these, too, are complex, minute and hard to analyse, yet they are less so than are the structures of any but the very lowest animals," and, as he went on to show, much slower. Having described the physiology of the fall of the leaf, he passed on to consider the response to injury in plants and animals, and showed the fundamental similarity. He spoke of canker of trees and said much of galls, but the reader of the address to-day is struck by the relatively little reference he made to infection, for galls are to be reckoned rather as due to infestation. As Paget pointed out, the reaction to injury in animals is largely influenced by the presence of blood vessels and nerves, but in both animals and plants the injured cells are killed, while the uninjured undifferentiated cells of the part proliferate and form a callus, by which means the repair is effected. The blood vessels in the neighbourhood of the injury are stopped by thrombosis in animals, and the water-conducting vessels in trees are occluded by deposits of gum and resin and by the ingrowth of cells (tylosis), both processes being calculated to limit infection.

The injury, whether in animals or plants, exposes the part to the invasion of saprophytic or lowly virulent organisms causing a localized lesion, or, if a more virulent type is admitted, a general poisoning leading to death by septicaemia in animals and to progressive rot in trees.

Repair is seldom a *restitutio ad integrum*. In animals and plants scars remain to testify to the skill of the surgeon or of the woodcutter. Wound-repair wood is not the same as normal wood. Soft spongy wood is produced with derangement of the elements or hard compressed wood, corresponding to rarefying or sclerosing osteitis. Progressive rot is caused by a fungus (polyporus), the ravages of which only become visible when the fruit bodies are produced; bracket-like projections from the trunk appear, and tell a tale of woe, sometimes confirmed by the fall of the branch or trunk owing to the complete destruction of wood that has taken place. Foreign or necrotic bodies are encysted in animals by connective tissue, in plants by cork cells, layers of which are formed to limit an infection or lock up dead matter.

Plants suffer also from spreading infectious diseases comparable to epidemics. Potato blight rivals influenza in the extent of the damage and destruction it produces. It caused the Irish famine of 1845. The existence of the fungus *Phytophthera infestans*, to which it is due, is ensured by means of carriers—that is to say, infected tubers from which the fungus grows up into the young shoots, its presence unsuspected, until black blotches covered with a whitish powder of spore-bearing hyphae or conidia appear on the leaves. These spores are spread by wind, animals, or insects, and give rise in the presence of moisture to biciliate zoospores, which gain entrance to the leaves of adjacent plants by the stomata; they send out hyphae between the cells of the host and push haustoria or sucking organs into the neighbouring cells in search of food. The potato tubers become infected by the falling spores which penetrate their substance through the lenticels or modified stomata. Exanthemata of plants is a term we would hardly like to use had it not been the title of a book published in 1833 by F. Unger of Vienna to draw attention to the many forms of leaf parasite described under the names of aecidium, puccinia, and uredo. The immediate interest of these parasites lies in the fact that they furnish an example of an infectious disease with an intermediate host comparable to malaria and sleeping sickness. The life-history is very complicated, including sexual phases indicated by fusion of nuclei which recall the story of the haematozoa of malaria. The history of "wheat rust" will serve as an example. The first appearance of the fungus is indicated in the summer by lines and streaks on the leaves from which a yellow powder is shed. From its apparently burning effect on the leaf this was called uredo and the yellow spores uredospores. As the summer advances the yellow patches become purple brown with spores of the same colour. These were called Puccinia, for the Italian Puccini first described them. They were supposed to be mildews, but it was found that they were resting spores (teleutospores) of the uredo. Now it had been surmised for some time that the barberry tree had an evil influence on wheat, and in 1760 it was made illegal in the State of Massachusetts to plant barberry trees near a wheatfield. The leaves of the barberry tree often bear a leaf parasite called aecidium which it was proved by experiment could be produced by an injection with the spores of puccinia, thus showing that conditions to which the terms uredo, puccinia, and aecidium had been applied were in fact cycles in the life of the same parasite.

A comparison of tumour formations in animals and plants is, at the present time, impossible from want of knowledge of the cause of animal tumours, apart from the infective granulomata; the pathology of the swellings of plants is, perhaps, better known than that of animals. Bacteria are responsible for many tumours, such as those of the olive and the root tumours of leguminosae, where they seem to be symbiotic, for they fix the nitrogen of the air for the ultimate benefit of their host. A fleshy growth in the stems of young fruit trees known as "crown gall" has been proved to be caused by a *Bacillus tumefaciens*, further study of which on the Paris daisy and other plants has disclosed metastatic growths and embryonic tissues, giving rise to aborted leaves and blossoms, to which the term "cancer in plants" has been applied. How far the term is justified future research only can tell, but the observations are of great interest.

Organisms allied to mycetozoa cause ulcerating tumours (finger-toes) on the roots of cruciferous plants, cabbage and others; and a similar parasite produces a lobulated swelling on the stems of bird's eye (*Veronica chaemydrys*). It originates from the infection of a young cell of the growing stem by a spore liberated from a globular case. As the plant cell divides portions of the amoebiform parasite is carried into the new cell, so that a mass of soft-celled tissue is produced consisting of infected and non-infected cells. The several centres of infection in the stem fuse into a lobulated swelling. The life of the parasite is passed in the enormously enlarged cells; maturity is reached when the spore case is complete; then the tumour dies and liberates the spore cases into the soil.

[2] BRITISH MEDICAL JOURNAL, 1880, vol. i, p. 611: *Essays and Addresses*, London, 1902, p. 240.

These discursive remarks may afford some indication of the wide field awaiting the Institute of Comparative Pathology which Sir Clifford Allbutt hopes to see established in Cambridge. But such an institute must be liberally endowed; not only must it provide well-equipped laboratories and ample space for field experiments, but a career must be opened up for young men of proved capacity, that they may be induced to devote their lives to this subject, so important to medicine, to veterinary medicine, to agriculture, and to horticulture.

ANNUAL MEETING NOTES.

THE Eighty-eighth Annual Meeting of the British Medical Association is in progress in Cambridge this week. The address given by Sir Clifford Allbutt, as President, on Tuesday evening, is published in full at page 1. As the Sections did not begin their work until Wednesday, it is not possible to give any account of their proceedings in this issue, save that it has been thought that members would be interested to read the address of Sir George Newman, President of the Section of Medical Education, and the opening papers in the discussion in that Section on "Preliminary Scientific Education in the Medical Curriculum." There are twelve Sections, of which five—Medicine, Surgery, Neurology and Psychiatry, Pathology and Bacteriology, and Physiology and Pharmacology—meet on three days, and the remainder on one day only. The Sections meet in the morning, and in the afternoon of each day a large number of demonstrations, including some cinematograph displays, have been arranged by Professors Sir G. S. Woodhead and W. E. Dixon, F.R.S.

The annual meeting of the Representative Body began on Friday, June 25th, and it has been found possible to publish reports of its proceedings on that day and on Saturday and Monday in the SUPPLEMENT for this week. Prefixed to them are some Current Notes on certain matters of particular interest discussed during the first two days.

1880—1920.

WHEN the British Medical Association held its last meeting in Cambridge it had for its President Dr. Humphry, then Professor of Anatomy, afterwards Sir George Murray Humphry, and Professor of Surgery. The Association had met once before in Cambridge—its thirty-second Annual Meeting—when it had Dr. George Paget, Professor of Physic, for its President. At the forty-eighth meeting, in 1880, Sir George Paget was President of the Section of Medicine, and his brother James was President of the Section of Pathology.

With regard to the conduct of business in the scientific sections a sentence in the formal manner of forty years ago seems worthy to be quoted: "Good management on the part of the several Presidents, a rigid adherence to the rule of limitation of time allowed to readers of papers and to the speakers, and no small forbearance on all sides, as well as diligence and method in the conduct of the business by the Secretaries, will be requisite to make good use of the material at their disposal, and to prevent dissatisfaction at the omissions of parts of the programme, which must in some instances be made." We do not know how far these injunctions were carried out, but the files of the BRITISH MEDICAL JOURNAL of that date are proof that a great deal of important scientific business was transacted in the eight sections. In the Section of Surgery a discussion was opened on the treatment of wounds by Professor Lister, who opened also a discussion in the Section of Pathology on micro-organisms and their relation to disease. In the Section of Public Medicine there was a discussion on the general working of the public health administration in Great Britain and Ireland, introduced by its president, Sir Henry Acland; before the discussion terminated the Section adopted a resolution demanding a comprehensive inquiry into the working of the Public Health Act (1875). In the Section of Psychology the influence of alcohol on the causation of insanity was discussed. One of the secretaries of the Section of Physiology was the late Dr. W. H. Gaskell, whose son is one of the secretaries of the meeting this week. It is recorded that the preparations for the annual meeting were "taken up in good spirit by the university and the town, as well as by the medical profession, and the colleges opened their doors with their usual hospitality." Thus history repeats itself.

In the course of his eloquent presidential address Sir George Humphry traced through past centuries the causes of the long neglect of medicine at Cambridge, answering his own question how it came about that Cambridge "more than any university in the world, with perhaps one exception, banished medicine from its walls, and the men of medicine from its schools." Though amends could never be made for past shortcomings he looked forward to a great future, most potent for good in connexion with medicine at Cambridge. "The opportunity is open not simply to influence the few, but to leaven the large masses of the profession. The opportunity lies in a progressive advance and expansion of the teaching, among which I include examining . . . In proportion as Cambridge avails herself of this opportunity, and in that proportion only, will her influence on medicine be great and good." He insisted again and again that upon the high character, soundness, and thoroughness of her teaching the Cambridge of the future must stand. "Cambridge must give that kind of teaching which will engender the broader and clearer appreciation of principles which will render the study of medicine a medium for the cultivation of intellect as well as a means of passing into a profession and earning a livelihood. It must show the scientific to be the natural and necessary adjunct to the practical, and must weave the two together into the woof of a high educational system." In Sir George Humphry practice and precept went hand in hand, and he himself did much towards the realization of his ideal. How much has been done in the same direction under the inspiration of Sir Clifford Allbutt during his twenty-eight years' tenure of the Regius Professorship of Physic is known throughout the profession.

In 1880, as this year, the University of Cambridge granted the honorary degree of LL.D. to a number of distinguished members of the profession. The list in 1880 consisted of Dr. C. E. Brown-Séquard of Paris, who, according to Professor Gley, was the first to conceive the idea of internal secretions; Professor Donders, one of the three great men who founded the science of ophthalmology—the others were William Bowman, who also received the honorary degree at this time, and von Graefe, who had died in 1870; Dr. S. D. Gross, the eminent surgeon of Philadelphia; Sir William Jenner, Bt., F.R.S.; Sir W. Gull, Bt., F.R.S.; Sir George Burrows, Bt., F.R.S.; the Rev. Samuel Haughton, F.R.S., of Dublin; Mr. Joseph Lister, F.R.S.; Dr. Denis O'Connor, who had presided over the annual meeting at Cork in the previous year; Mr. (afterwards Sir) John Simon, F.R.S., the first medical officer to the Local Government Board; and Dr. Andrew Wood, F.R.S.

DR. J. A. MACDONALD.

EVERY member of the British Medical Association who knows anything of its political and administrative work during the last fifteen years will learn with regret that Dr. J. A. Macdonald has decided not to seek re-election as Chairman of its Council, an office he has held during the last ten years. The opportunity now afforded to members of the Association to give him some tangible evidence of the esteem they feel for his character and achievements will be welcome. The debt they owe to Dr. Macdonald is very great. And the debt is due not from members of the Association alone: he has given time and energy to its service without stint because he looked upon

it as the great voluntary organization of the profession, well fitted to maintain its status as a liberal profession, to increase its efficiency and extend its influence. He was concerned in the movement which in 1902 led to the reorganization of the constitution by the multiplication of units (Divisions) sending representatives to a body which determines the policy of the Association. He was a member of the Representative Body from the beginning and became its Chairman in 1906; in 1910 the Council elected him its Chairman. During all these years he has exercised a great and always wise influence in the counsels of the Association. While ever ready to encourage or suggest vigorous action when a subject has been thoroughly examined and discussed, he has been a steadying influence when enthusiasm exceeded the dictates of prudence or tended to forget the fundamental principles he held it essential to observe. His influence is due to perspicacity of thought and a clear instinct for essentials. All will be glad to know that his services will continue to be at the disposal of the Association, but to those who in any capacity have been associated with him in the administrative affairs of the Association his withdrawal from the conspicuous position he has so ably filled is a matter of acute regret. As the Chairman of the Representative Body, in making the announcement to the meeting at Cambridge, well said, Dr. Macdonald's personality has counted for much. Everyone brought into contact with him learnt not only to admire him as a debater, chairman, and administrator, but to like him as a man. Readers who refer to what Dr. Garstang said will see that the members of the Council have taken the initiative in subscribing to a fund to present him with a testimonial as some recognition for the great work he has done for the Association during a critical period of transition, rudely interrupted by the war which threatened to throw the machinery out of action. That the Association has come through with reputation enhanced and influence increased is largely due to his wise guidance and prudent counsels.

"A Concise Guide."

The Executive in Cambridge has presented to every member attending the Annual Meeting a copy of J. W. Clark's famous *Concise Guide to the Town and University of Cambridge*. Its author was a son of William Clark, Professor of Anatomy in the University, and lived the seventy-seven years of his life in Cambridge. He was Superintendent of the Museums of Zoology and Comparative Anatomy, and did a great deal for them and for the School of Biology. Afterwards he was Registrary, a term the University rather strangely applies not to the place, that is, the Registry, but to the person by whom its registers are kept. His biographer, Sir A. E. Shipley (who at the end of 1914 described in this JOURNAL the minor horrors of war), says of him: "J." as he was called, "was always willing to place his unrivalled knowledge of college buildings at the disposal of friends." In his *Concise Guide* he did as much for all who care to take its four walks through the colleges and the town. For this special British Medical Association edition Sir Clifford Allbutt has written an introduction, giving a brief sketch of the history of the medical school of Cambridge, with some reflections on the lessons of the past, the attainments of the present, and the needs of the future.

Annual Exhibition.

The exhibition of surgical instruments, foods, and drugs, was opened in the Cambridge Corn Exchange on Tuesday morning, June 29th. Sir Clifford Allbutt, K.C.B., President of the Association, who was greeted with applause, said that it was his pleasure to declare the Exhibition open, and he trusted that everyone concerned would have a very successful time. An account of the exhibits will appear in later issues.

THE DUKE OF CONNAUGHT, F.R.C.S.

The Duke of Connaught was admitted an honorary Fellow of the Royal College of Surgeons of England on June 24th, when he visited the College accompanied by Sir Malcolm Murray and Colonel Sir Edward Worthington, A.M.S. He was received at the College by the President, Sir George Makins; the Vice-Presidents, Sir Anthony Bowlby and Sir John Bland-Sutton; and the secretary, Mr. Cowell. The admission took place in the Council Room, where the members of the Council were assembled, with Lieutenant-General Sir John Goodwin, D.G.A.M.S., and Lieutenant-General Sir George Macdonogh, Adjutant-General. The President referred to the association of His Royal Highness with the medical profession as Colonel-in-Chief of the Royal Army Medical Corps, and mentioned that King Edward, when Prince of Wales, was the first to become an honorary Fellow of the College, and that King George had also become an honorary Fellow when Prince of Wales. The Duke of Connaught, in reply, expressed his pleasure at becoming an honorary Fellow, and signed the roll. A visit was afterwards paid to the museum, where the President and Professor Arthur Keith, F.R.S., showed some of the specimens from the War Office collection

COMPARATIVE ANATOMY OF THE TEETH.

The Museum of the Royal College of Surgeons has been enriched by a gift of the utmost value to all who are investigating the microscopic structure and comparative anatomy of teeth. The gift has been made by Sir Charles Tomes, F.R.S., and contains not only preparations made by himself in the course of a lifelong research but also those made by his celebrated father—the founder of scientific dental anatomy—the late Sir John Tomes, F.R.S. Although a great many of the microscopic specimens thus presented to the College of Surgeons have been used in the preparation of various memoirs published in the *Philosophical Transactions* and in the *Transactions* of the Odontological Society by the donor and his father, there are others which have not been described. The "Tomes" collection contains representative specimens drawn from all parts of the vertebrate kingdom, and is particularly rich in preparations showing the structure of the teeth in modern and in fossil fishes. The microscopic anatomy of mammalian teeth is very fully illustrated. Altogether there are over 1,300 preparations.

LARYNGOLOGY.

The second annual summer congress of the Section of Laryngology of the Royal Society of Medicine took place last week. At the dinner at the Café Royal on June 24th, when Mr. Mark Hovell was in the chair, there was a large company of members and guests. After the loyal toast had been honoured Sir George Makins, G.C.M.G., P.R.C.S., proposed prosperity to the Section of Laryngology and the science it upholds. He had, he said, witnessed the rise of this specialty. The invention of the laryngoscope by Garcia was the starting point of progress. In 1881 the International Medical Congress first recognized laryngology as a subsection; henceforward its scope increased and the comic limitations broke down. It was astonishing to look back on the change of attitude towards, for instance, carcinoma of the larynx. Another great step forward was the perfection of direct methods of examination, and the treatment of the accessory sinuses. He ended with a reminder of the need for specialists to keep in contact with the general surgeon and physician. The toast was acknowledged by Sir James Dundas Grant, who expressed everyone's appreciation of what Sir George Makins, "the looker on who sees most," had said. In a brief survey of the history of the Section, Sir James spoke of the success attending the summer congress. The health of the guests was proposed by Sir StClair Thomson, who expressed his pride in belonging to a hospitable section. He mentioned

those who, though invited, were unable to be present, and read a complimentary message to the Section and its secretary, Dr. Irwin Moore, from Sir John MacAlister. Sir StClair Thomson, taking up the point made by Sir George Makins, maintained that the general surgeons should bear in mind the need for reciprocity, for they had something to learn from, as well as to teach to, the laryngologists. He deplored the neglect of laryngology in medical education. The toast was responded to by Dr. J. J. Killeen, Chicago; Dr. Van Den Wildenburg, Belgium; Dr. Lemaitre, one of the five official representatives of otology in Paris; and Dr. Rodriquez of Madrid. The Chairman's health was proposed by Dr. Jobson Horne, and Mr. Mark Hovell briefly replied. A feature of the evening was the song by Mr. Gustav Garcia, who, though 83 years old, showed he had lost nothing of his hereditary art. He is the son of Manoel Garcia, and his own son also was present.

PLEURAL REFLEX SYNCOPE.

It has long been taught that syncope and death may arise from irritation of the pleura, even from so gentle a stimulus as irrigation of an empyema cavity. The experiences of war have taught us that the chances of an untoward happening from such reflexes are in reality very small. We know that a thoracotomy may be performed, the ribs spread apart, the lung handled as if it were intestine, and rents in it explored and sutured, with surprisingly little shock to the patient. Further, we know that Carrel-Dakin tubes may be placed in empyema cavities and frequent instillations be made. Bismuth can be injected into such cavities for the purpose of determining their size, position, and shape, and provided that the cavities are not overfilled no harm is done. All these experiences have engendered a certain contempt for the old doctrine of the danger of reflex syncope through the stimulation of the rich subpleural nerve plexus which pours its impulses into the vagus. To a certain extent this contempt is well founded, but, lest any should suppose the old warnings are no more than old wives' tales, alarming little accidents from time to time occur. They usually pass unrecorded, but two cases recently reported in the French literature have a bearing on this point. Montaz[1] describes the case of a soldier wounded by a shell fragment in the right chest. The man presented signs of shock out of all proportion to the extent of the anatomical injury. The usual resuscitatory methods were of no avail, and operation was undertaken. Very little damage was found inside the chest; the entrance wound was excised and closed. A small piece of shell was known to be lodged in the rib "grille" behind, but was not sought, as it was believed to be doing no immediate harm. A little later, twelve hours after he was wounded, the patient died. At necropsy a piece of shell with sharp edges was found projecting by 1.5 cm. into the pleural cavity at the level of the sixth rib. Montaz ascribes death to vagus reflex from the irritation of the pleura by the shell fragment. He compares his case with one previously published by Pierry.[2] Here a patient with a chest wound of apparently no great severity died suddenly during a radioscopic examination. *Post mortem*, a medium sized haemopneumothorax was found, but the fourth rib was badly broken and the sharp fragments presented like needles to the surface of the lung. These two experiences, whilst falling short of absolute proof, support the belief that the pleural reflex is an entity not altogether to be forgotten.

The presentation of the testimonial to Sir John MacAlister will take place at the annual meeting of the Royal Society of Medicine on Wednesday, July 7th, at 4.30 o'clock.

[1] Montaz, R: Du rôle des irritations localisées de la plèvre, etc. *Lyon Chir.*, 1919, 16, 159.
[2] Pierry: Mort subite par accident nerveux d'origine pleurale. *Lyon Méd.*, April, 1917.

Medical Notes in Parliament.

Financial Position of Voluntary Hospitals.—On June 23rd Dr. Addison said that the financial position of hospitals in London had been receiving anxious consideration for some time. The Council of King Edward's Fund had decided to make an immediate distribution of £250,000 to meet the pressing needs of the hospitals in London. The question of the extent to which it might be necessary to supplement this grant from other sources and the best method of giving such further assistance as was necessary without discouraging voluntary subscription was under review; but the whole question involved many complex issues, and he was not at present in a position to make a statement. In reply to another question on the same day as to whether if grants from public money were made to voluntary hospitals they would be conditional on the appointment of representatives of the public to the governing bodies, Dr. Addison said that in the event of any grants being made from public funds for the assistance of the voluntary hospitals, such conditions would be attached to the grant as were necessary to secure that they were properly expended, but he did not think that the hon. member's suggestion would be effective for this purpose.

Motor Spirit Duty Revenue.—Mr. Neal informed Sir W. Joynson-Hicks that the quantity of imported motor spirit upon which the estimate of a flat rate duty of 1s. a gallon necessary to provide the income for a full year was based was an annual importation of 146,000,000 gallons. This estimate was derived from returns relating to the number of licences issued during 1919–20, and the quantity of duty-paying motor spirit imported for the year ended October 31st, 1919. Allowance was made for the estimated increase in the number of motor vehicles and the consequent increased consumption of petrol. Allowance was also made for the estimated revenue from existing licence duties on private motor vehicles and public service vehicles and from horse carriage and drivers' licences. No allowance was made for any system of licence duties on steam and electric vehicles nor for any schedule of duties in respect of vehicles on which no tax is at present payable.

Part-time Pension Medical Officers.—In reply to Captain Elliot, on June 22nd, the Home Secretary said that the Treasury had sanctioned an increase of remuneration for part-time medical officers.

Pensions for the Blind.—The money resolution to enable pensions to be paid to the blind at 50 years of age equivalent to those given to old-age pensioners at 70 came before the House of Commons in committee on June 25th. The provision is needed if the Government bill introduced by Dr. Addison some weeks ago is to be effective. Dr. Addison said that the age of 50 had been chosen as persons below that age were more or less trainable. The intention was to make an Exchequer grant of 50 per cent. towards the expenditure of local authorities for training purposes, and it was hoped that in a large number of cases contributions would thus be afforded for existing institutions. In a discussion which followed it was strongly urged that local authorities should be compelled to provide the training facilities. Mr. Baldwin, the Financial Secretary to the Treasury, said he could not hold out any hope that more money would be forthcoming from the Treasury, and it was pointed out that if members rejected the resolution the bill would be jeopardized. In these circumstances the motion was carried.

Ex-Service Men in Asylums.—Major Tryon, in answer to Mr. Hurd on June 28th, said his attention had not been called to a resolution of the National Council of Evangelical Free Churches as to the incarceration of ex-service men in pauper asylums. Any ex-service man suffering from certifiable insanity, who was confined in a county or borough asylum, was by special arrangement treated, not as a pauper lunatic but as a service patient, if his condition was a result of war duty. Thus he was entitled to all the privileges of a private patient, the entire cost of his maintenance and treatment being borne by the Ministry of Pensions. The Minister was satisfied it would not be in the interests of the men themselves, nor of their relatives, that they should be treated in special establishments. He was, however, taking steps to assure himself that the present arrangements were in all cases working satisfactorily.

Indian Medical Service Pensions.—Mr. Montagu informed Colonel Yates, on June 28th, that he had received from the Government of India a telegram on the subject of an increase in the pensions of the widows, children and dependants of deceased officers of the Indian Army, the Indian Medical Service, and the Royal Indian Marine; it was now having his consideration.

Financial Position of Voluntary Hospitals.—Lieut.-Colonel N. Raw asked the Minister of Health, on June 28th, if, having regard to the serious position of the voluntary hospitals throughout the country and the consequent prejudicial effect on the national health, he would consider the desirability of appointing a Select Committee of the House to consider what steps, if any, could be taken by Parliament to relieve this serious situation until the new scheme for health services was considered. Dr. Addison replied that he did not consider the appointment of a Select Committee was desirable at this stage.

Answers in Brief.

In reply to a question as to the average alcoholic strength, measured in proof spirit, of beer 1044° specific gravity in Great Britain, and 1051° specific gravity in Ireland, and of other alcoholic drinks at the strength authorized by the Central Control Boards (Liquor Traffic), Mr. McCurdy stated that the strengths varied with the extent to which fermentation has been carried. The averages, however, are approximately as follows: Beer (Great Britain) 8 per cent., (Ireland) 9 per cent.; cider, 7 per cent.; claret, 18 per cent.; burgundy, 22 per cent.; sherry, one variety 29 per cent., another variety 35 per cent.; port, 36 per cent.; champagne (estimated, no record of any actual test), 18 per cent.; whisky, rum, and gin, 50 per cent. as a minimum to 70 per cent. as a maximum.

The considered policy of the Government is to inform hunger strikers that they must face the consequences of their action.

An increase of 30 per cent. on house rents (exclusive of rates) would raise the index figure relating to the cost of living by about 3½ points. The expression "tenant" in the Rent Restriction Bill means any person to whom a house or part of a house is let furnished or unfurnished, but it does not include a lodger who has a right only to the use of the premises but no right of exclusive occupation.

The number of births registered in England and Wales during the first quarter of the present year was 271,082, as compared with 154,920 last year and with 217,414 in 1914.

The cost of an artificial limb supplied to fit amputations above the knee, as distinct from other classes of leg amputation, varies from £15 10s. to £25. No separate record is kept by the Ministry of Pensions of the number of artificial legs of this kind supplied by the Department.

MOTOR NOTES FOR MEDICAL MEN.

By H. MASSAC BUIST.

Left-hand Drive and Char-à-banc Problems.

As regards the actual use of motor vehicles on the highway the two topics uppermost at the moment, and which concern medical men more or less directly, are what is called "the left-hand drive" and the appearance on our highways and byways in ever-increasing numbers of excessively wide char à-bancs with great overhang beyond the back axle for the sole purpose of enabling such vehicles to accommodate the maximum number of passengers on a single as distinct from a double-deck principle.

The rule of the road in this country from time immemorial has been such as to make it practically universal to drive from the seat on the right hand of the vehicle. But as the British rule of the road differs from that in America or in France, it follows that cars manufactured in America, in particular, are furnished with the driving seat on the left. Until quite recently, vehicles made in the United States for the British market were always fitted with special right-hand drives. But now what is called a mass-production car, the Continental-built Citroen, for example, which is now beginning to be exported to this country, is fitted with a left-hand drive. Thus the problem no longer wholly concerns the trade in American motor cars. Moreover, in a few cases cars figuring as British products, or at least marketed as from British works, have the left-hand drive for the simple reason that the engine and gear set are supplied from America.

Provided that it could be guaranteed that every user of a motor vehicle drove with care and judgement, I doubt if there would be any current agitation against the left-hand drive. Unhappily, however, it is impossible, especially at this period, to guarantee careful driving. Anyone who has had road experience in Wales, for example, where the miners use their cars alike to take them to and from their work and for pleasure, will be well aware that, in general, they lack what is called the road sense. In other districts other classes quite new to mechanical road travel and who, possibly, will never have the aptitude for driving, are taking to owning and using motor vehicles. In the majority of cases such new owners are acquiring machines with left-hand drives, for the simple reason that they seek the cheaper varieties of cars, notably those made from American designs, if not actually manufactured in the United States. Their presence on the road concerns none more than medical men, who have to drive at all hours of the four-and-twenty.

Why the British Situation is Unique.

In regard to the international aspect, I know no law in the United States of America that prohibits the use on American roads of an English car with right-hand drive. Nor, for that matter, do I know that any country on the Continent prohibits our using such vehicles provided they are re-registered for service on the Continent. On the other hand, there is no gainsaying that the quantity of such vehicles in use in America is utterly negligible in relation to the whole motoring movement there; while on the Continent the right-hand drive common in this country is likewise common among vehicles manufactured there. Thus there is no question of changing the national methods of driving on the Continent as there is here.

Both American and Continental roads have features in common which are lacking to our thoroughfares. Abroad the majority of the main roads are scientifically graded and go as directly from point to point as possible. Neither are they characterized by those hedges and such-like features which render our roads more or less picturesque arteries of traffic of continually varying gradients perpetually swerving in direction. Therefore it is practically impossible usefully to compare highway traffic conditions in this country with those that obtain abroad.

Nor is this all. In this country the proportion of vehicles which have left-hand drives is already very great, and is increasing every month in measure as the cheaper cars are being issued. Why they should not be made specially for our market with the right-hand drive in conformity with our hitherto universal practice, as was general before the war, is no mystery. In America, as in France, it is cheaper for the manufacturers of cars with left-hand drive to make the British public acquire them with that drive than it is to make a special right hand drive for such vehicles of their building as are to be sold in this country. In short, we are merely dealing with the proposition of the pocket interest of foreigners who are sending into or erecting in this country, in our time of impoverishment, articles which we can manufacture entirely. In regard to the Ford vehicle, which is partly manufactured and partly assembled over here, and which may be wholly manufactured here, the reason the left-hand drive is being used is that the output of the factory in this country is to be distributed between the home and some other markets, among the latter some where the left-hand drive is in vogue. If public opinion is willing to have it in this country, of course it makes for extra profit not to deviate from standard.

The Doctor's Case.

Where the matter concerns the medical man is that he chiefly wants the cheaper varieties of car. I have not yet encountered any doctor who wants a left-hand driven car for its own sake. He merely accepts it because it is a type that suits him, because it is marketed at the price nearest to what he wishes to pay, and because he finds he can drive it. As a class, doctors are characterized by the discretion with which they drive, but that cannot be applied to motorists in general in the post-war period.

Obviously it will be a matter of very serious concern to medical men who have locked up their capital in acquiring cars with left-hand drives if the result of the Government inquiry now proceeding were to cause the prohibition of this form of car control. They are chiefly concerned with the case of the Ford as distinct from that of the Citroen, which has scarcely begun to be delivered in appreciable quantities in this country. As far as the Ford is concerned, the firm standardized the right-hand drive in this country for years before the war, therefore it can do so again. Rather than lose the goodwill of the medical profession, there is no gainsaying that, if the law should prohibit the use of such vehicles, the firm could supply right-hand drives for quite a small sum of money. But it would be a hardship if medical men were asked to part with even that in face of the many burdens they bear.

It would appear possible to recommend a middle course. Undoubtedly we must deal with cars as used by the public in general, of which the medical profession is a section. One form of drive should be common throughout the country. The right-hand drive has been used successfully from time immemorial, and is employed in connexion with horse-drawn vehicles and so forth. Therefore it is better to adhere to that, since the only logical alternative is to make it obsolete and call on owners of cars with the right-hand drive to have them converted to left-hand drives.

But public opinion would not tolerate that. Nor need it be necessary to compel doctors to spend money on having their left-hand driven cars transformed to the right-hand drive. On the contrary, a regulation might be introduced

to the effect that henceforth no cars may be imported into, assembled, produced, or placed on the market for service in this country with left-hand drives; but that those which are in private ownership at the time of such a regulation may continue to be used. The matter could be checked by registration with the local police, so that there would be no opportunity to smuggle extra cars. Were that done every season would witness an amelioration of a state of affairs that ought never to have arisen, and five years should see the last of such cars off the roads. It is right to save the medical profession from an additional burden in these times of many heavy burdens. But it were wrong to attempt to increase a motor trader's profits at the expense of adding another risk to highway usage by permitting a continual increase in the number of vehicles used with left-hand drives. No country can compare with ours in the sheer variety of makes of cars on the road, and the majority have right-hand drive. Let it be had in mind that probably far more women and men of no road sense than medical men are owning and running cars with left-hand drives to-day. The former create the danger. The fact that the doctors of the country owning left-hand driven cars are no more dangerous on the road than those who own right-hand ones does not affect the major point. But, once embarked, a doctor's capital should be ensured to him. Medical men have not even requested that they should be furnished with left-hand drives. All that rests entirely with the manufacturers or assemblers who seek to make bigger profits and to save themselves trouble by offering medical men left-hand models of given type or nothing. The medical men in question have had no option but to take such cars as they are marketed. In nearly every case they are the only machines within the purse range of the individual buyer.

(To be continued.)

England and Wales.

Grant to London Hospitals from King Edward's Hospital Fund.

At a special meeting of King Edward's Hospital Fund, held on June 22nd, it was resolved, on the motion of the chairman (Lord Donoughmore), that an emergency distribution of £250,000 should be made out of available general funds to assist the London hospitals in their present need. Lord Donoughmore stated that the problems of the present debt of the hospitals and of their future maintenance arose partly from the difficulties into which the hospitals got during the war and partly from the diminution since the war of the subscribing power of their friends. If the urgent problem of the present debt were not dealt with the burden under which the hospitals laboured might prove to be too great to be borne. The quarter of a million which it was proposed to distribute in this emergency would be taken from the capital funds, and its distribution would diminish the amount of income hitherto available for annual grants. At the same time it would not provide anything like a complete solution of the hospital problem, but would have to be supplemented by efforts of kindred organizations, and notably by further support on the part of the general public. It must be remembered that the voluntary hospital problem was one for the whole country, but the present grant concerned London alone. Lord Burnham referred to the necessity of adequate support being given by the working people of London; their present contributions towards the maintenance of their hospitals amounted to 10 per cent. only, as against 75 per cent. contributed to local institutions by working people in some of the provincial towns. A message was read from His Majesty the King, patron of the Fund, cordially approving of the resolution and expressing the hope that other societies and public bodies, as well as private individuals, would join in the effort to meet the present needs of the London hospitals and thus ensure the continuance of the voluntary system.

Southampton Medical Salaries.

A combined meeting of members of the Southampton Division of the British Medical Association, Medico-Political Union, Southampton Medical Society, Public Medical Service, Local Medical and Panel Committees, was held at the Royal South Hants and Southampton Hospital on June 23rd, and there was a large attendance. The meeting was called for the purpose of discussing the remuneration paid to public medical officials in the borough. Strong comment was made at the totally inadequate salaries paid to the medical officers working for the Southampton Borough Council, and it was unanimously decided to send a letter to the borough council, to the individual members of the council, and to the press, asking that the salaries of these officers should be increased by at least 50 per cent. The grounds for this request are briefly as follows: (1) The great depreciation in the value of money and the increased cost of living; (2) the increasing importance and responsibility of these officers' work; (3) fees in other branches of medical work have been raised from 50 to 100 per cent.; (4) Southampton lags behind many other councils in this respect; (5) the remuneration of officials in other professions has been raised; (6) the officers have no pensions to look forward to. The letter added that, owing to the increase in the number of junior posts in the public health service, only a small percentage of men can hope to reach the position of Principal Medical Officer of Health.

Central Midwives Board.

At a meeting of the Central Midwives' Board for England and Wales held on June 23rd, Sir Francis Champneys presiding, three midwives were struck off the roll. A defended case from South Shields was not proceeded with, the Board deciding on this course of action until the local supervising authority should send its officials, which it had abstained from doing because the Board does not defray travelling expenses.

The principal business dealt with in the afternoon comprised the consideration of a letter from the Ministry of Health enclosing for the observation of the Board a copy of the revised scale of fees which the Ministry proposes to prescribe for payments by local supervising authorities to doctors called in by midwives under Section 14 of the Midwives Act, 1918, and also a copy of the suggested alterations in Rules E 20 to 23 in order that the Board's rules may be brought more into conformity with the above section.

Correspondence.

VACCINAL CONDITION OF SMALL-POX CARRIERS.

Sir,—I trust I am not doing Dr. Millard an injustice if I interpret his letter under the above heading in your issue of June 19th as a plea for the discontinuance of infantile vaccination because outbreaks of small-pox have been traced to unrecognized mild cases in vaccinated persons, his object apparently being to ensure, as far as possible, that all cases shall be of such a degree of severity as to be unmistakable to the inexperienced observer. Unfortunately the cultivation of a severe type of small-pox would not attain this object, since the severest type of confluent small-pox may, by its very severity, lose those characteristics on which an inexperienced observer is accustomed to rely for diagnosis, and such cases have been watched to their inevitable end without arousing suspicion as to their real nature until secondary cases have arisen. Similarly haemorrhagic cases have been certified as dying from measles or blood poisoning, subsequent events only betraying the real cause of death.

As regards the mild cases to which Dr. Millard particularly refers, it is not, I think, generally appreciated that such cases not infrequently occur in unvaccinated persons, and for this very reason are liable to be mistaken for chicken-pox. Thus, of 1,793 discrete cases in unvaccinated persons of which I have records 413 were of the very mildest type, and of these 192 were under ten years of age. The great majority of these occurred in epidemic periods—a fact which probably contributed materially to their recognition, and it is at least probable that a fair proportion would have passed unrecognized had they cropped up unexpectedly in a non-epidemic period.

Whilst unrecognized cases, mild or severe, have repeatedly given rise to outbreaks of small-pox in an imperfectly vaccinated community such as exists in this country,

I have little doubt that similar cases occur without ill effects, and, though the proof of the occurrence of such cases is necessarily wanting, the possibility of their occurrence must be taken into consideration in estimating the advantages to the community of the present system of vaccination.

When Dr. Millard's ideal of an unprotected population is realized—which it may be in the not very distant future—I am afraid he will still find himself confronted with the unrecognized case, mild, moderate, or severe; and, since even in the best administered district circumstances must arise in which valuable time is lost before all contacts are traced and vaccinated, I trust he may never have cause to regret having assisted in casting aside the partial protection now afforded by the present imperfect system.—I am, etc.,

Gravesend, June 22nd. ARCHIBALD KIDD.

THE ARMY MEDICAL SERVICES IN THE WAR.

SIR,—After the well-deserved panegyrics bestowed by a past and the present Secretaries of State for War, at the dinner held on June 8th, upon the wonderful work of the Army Medical Services during the war, why were not the names of the three Director-Generals A.M.S., namely, Sir Alfred Keogh, Sir Arthur Sloggett and Sir John Goodwin, included amongst the recipients of peerages, baronetages, and pecuniary grants from the State so justly bestowed upon celebrated combatant officers? It cannot be urged in extenuation of this omission that these officers did not deserve these honours and emoluments, as the chronicle of their wonderful achievements as crystallized in your report of June 19th entirely negatives that. Is it that in peace the old evil spirit of indifference to the Medical Service is not completely exorcized, and that this, as many former concessions which have been obtained, can only be wrung from the War Lords at the "point of the bayonet"?

I have now completed fifty years in the Medical Services of the Volunteers, Militia, Territorials, and Regulars, and entirely agree that the War Lords most sympathetic to the medicals were Mr. Brodrick and Mr. Haldane.

Great discontent still exists amongst the Territorial medical officers anent their position during the recent war. In 1903 the Volunteer Senior Medical Officers' Association (of which I was chairman) obtained a number of concessions from Mr. Brodrick, and more in 1908 from Mr. Haldane. But one thing—namely, that we should have one of our own medical officers as our head at the War Office—was in each instance refused.

Recently I read in the BRITISH MEDICAL JOURNAL that this request made by a deputation to the present D.G.A.M.S. was again refused on the grounds of expense.

Finally, at the Trooping of the Colours and similar functions, why is no medical representative on the Staff present?—I am, etc.,

P. BROOME GILES,
Bletchley, Bucks, June 27th. Colonel A.M.S.(T.F.).

A BLIND ALLEY.

SIR,—The question of salary in regard to the work of assistant medical officers of health is a most important one, and for the vigorous support which the Association is giving to the demand for more adequate recognition in this direction most hearty gratitude is due. There are, however, other grievances, or at least disabilities, under which assistant medical officers labour, more especially those concerned mainly in school inspection work. These disabilities arise from the fact that all such posts are apparently still considered as merely stepping stones to others higher in the service, and therefore to require no higher status than that generally accorded to a young and inexperienced practitioner, who expects to be purely subordinate and to have little responsibility or opportunity of developing the work along his own lines. It must be recognized, however, that, as things are at present, a majority of those who take up school inspection work have little prospect of attaining any of the higher administrative posts, and if the work is to be performed adequately and with benefit to the community, sufficient attractions must be held out to induce capable men and women to take these posts and to hold them over a considerable period. Some appointments naturally must remain subordinate ones; it is only argued that all need not so continue.

At present tuberculosis officers, infant welfare officers (in some cases), and school dentists are given considerable independence in, and control over, their own department, but an assistant engaged mainly or entirely in school work is very frequently an utterly subordinate official lacking any opportunity of presenting or carrying through schemes for the better administration or development of his work, not permitted to attend the meetings of committees concerned, and unable to make any reports in his own name, or without the editing of the medical officer of health. The latter, as a rule a very busy man, with probably little practical experience of school work, does not take much interest in this branch; the one requirement is that the obligations entailed by the Ministry of Health shall be fulfilled with the minimum of expense. This generally entails for the assistant concerned unending drudgery at routine work with no time to pursue any branch of research, and very little for variation by work in other branches of public health work, even when the terms of the appointment promise such variations.

Were the inspectors of the Ministry of Health to make a point of interviewing the officer actually engaged in the practical carrying out of the work they come to inspect, they would receive much information of value to the efficiency of the service without in the least encouraging disloyalty to the chief administrative officer. Many of us feel that there is work of considerable interest and importance to be done in the school medical service. In rural districts the stationary nature of the population makes it possible to keep track of such cases as mild forms of congenital heart disease for years after they leave school, and the exceedingly interesting problems which even a moderate use of "intelligence tests" suggest form another fruitful field of research. At present, however, the handicaps are so great that there is little prospect of much useful work being done, and school inspection will continue to be very much a matter of the collection of unreliable statistics by people of mediocre abilities—the only type who can possibly be content to remain in such positions.

I enclose my card, but for obvious reasons sign myself merely

June 20th. "ONE OF THEM."

FUTURE PROVISION OF MEDICAL SERVICES.

SIR,—Dr. Dewar says that he has waited at least a fortnight to see what doctors are writing concerning the Report of the Medical Consultative Council. Surely one obvious reason for the silence of the profession is that they have been "broken to harness," and are now running under the whip of the Government with "the panel bit and bridle" in their mouths! Some occasionally try to kick over the traces, but most are content to go quietly as long as the quarterly cheque is paid fairly promptly; others quite enjoy the new experience, and have no desire to run wild again.

Now that a much larger scheme is in sight they know that it is useless to rebel, and therefore in course of time groups of doctors will willingly submit to Government team work.

It would be a waste of time to discuss the working of the panel system, for most intelligent people know that it has some advantages; but the disadvantages far exceed the advantages, especially with regard to the treatment received.

If the new scheme puts an end to the callous manner and lack of examination of the chest, throat, heart, and very often indeed the pulse, etc., then I would welcome a system which will make the work both interesting and encouraging to the doctor and satisfactory to the patient.

It is common knowledge that to try and get well from a serious illness through the channel of the Insurance Act has proved a failure, and this explains why so many panel patients prefer to pay "a proper doctor"!—I am, etc.,

Willesden Green, N.W., June 24th. C. L. TRAYLEN.

IN Vienna the death rate still considerably exceeds the birth rate. During the last week of April there were 505 births, excluding 68 infants born dead, and 721 deaths. During the last week of March Berlin had 1,062 deaths and 1,002 births, and London 2,701 births and 1,438 deaths.

Obituary.

WE have to record the death of another Crimean and Mutiny veteran, Assistant Surgeon ROBERT GRAVES BURTON, R.A.M.C. (retired), who died at Ealing on June 17th, aged 89. He was born in Eastern Canada on May 24th, 1831, his father being the Rev. Edmund Burton, rector of Cloyne, and his two grandfathers the Right Rev. Edward Burton, Bishop of Killala, and the Right Rev. Bishop Graves of Limerick. Sir Richard Burton, the famous Orientalist, traveller and translator, was his first cousin. He was educated at McGill College, Montreal, and at Edinburgh, where he graduated M.D. in 1853, and took the L.R.C.S. Edin. in the same year. He entered the army as assistant surgeon on February 24th, 1854, resigning on December 4th, 1863. He served with the 77th Foot, the East Middlesex regiment, now the 2nd battalion of the Middlesex regiment, the "Diehards," throughout the Crimean war. He was present at the Alma, Inkerman, and the siege of Sebastopol, and received the Crimean medal with three clasps, the Turkish and Sardinian medals, and the 5th class of the Medjidie. In April, 1857, he was transferred to the staff, and went to India, where he served in the Mutiny, and took part in the siege and final capture of Lucknow, receiving the medal and clasp. In July, 1858, he joined the 6th Inniskilling Dragoons, and in September, 1860, was transferred again to the staff, and posted as assistant surgeon to the Royal Arsenal at Woolwich. After he had quitted the service on account of ill health, he went into practice at Plumstead, Kent, and a few years later removed to Hanwell, where he was for many years medical officer of health. He retired from practice many years ago.

WE regret to record the death, on May 13th, 1920, of Dr. JAMES LINDSAY H. H. PORTEOUS, of Yonkers, New York. He was born in Ayrshire, Scotland, in 1847, was the son of a Scottish clergyman, and as a boy attended the Ayr Academy and Edinburgh High School. He graduated M.D. at St. Andrews University, and was a Fellow of the Royal College of Surgeons of Edinburgh. After holding house appointments in Edinburgh and Liverpool, he acted for some years as emigration surgeon on American and Canadian steamships. In 1885 he began practice in Yonkers, and was a member of the honorary staff of St. John's and St. Joseph's Hospitals there. Dr. Porteous, who was for many years a member of the British Medical Association, was the author of numerous papers on zymotic diseases and their treatment.

Medico-Legal.

A DOCTOR'S LIBEL ACTION.

At the Leicester Assizes, on June 12th, before Mr. Justice Horridge and a special jury, Dr. John Thomas Horron Davies, J.P., of Leicester, brought an action against Lady Rolleston of Glen Parva Grange, Leicester. The plaintiff claimed damages for an alleged libel in a letter dated May 17th, 1919, and addressed to Dr. Slight. The defendant admitted authorship of the letter, but pleaded that it was a privileged communication. Mr. Hollis Walker, K.C., and Mr. Marriott, instructed by Messrs. Hempsons (on behalf of the Medical Defence Union), appeared for the plaintiff, and Mr. Hugo Young, K.C., Sir Hugh Fraser, and Mr. Stimson, instructed by Mr. Ernest Bridgman, Leicester, for the defendant. Full reports of the case appeared in the *Leicester Daily Post* and the *Leicester Mail* of June 14th, 1920. The letter containing the alleged libel referred to an injection of morphine given shortly before Sir John Rolleston's death, which had occurred on April 9th, 1919; it included the passage: "I consider that Dr. Davies murdered him, and all my friends agree with me. You can tell Dr. Davies or show him my letter. I don't care what you do in the matter." In the circumstances, said plaintiff's counsel, Dr. Davies had no option but to vindicate his personal honour and his professional reputation. Lady Rolleston was communicated with, and invited to withdraw the imputations and apologize. This she had declined to do on the ground that she believed herself to be privileged to express her opinion to Dr. Slight in the way she did. During the course of Dr. Davies's evidence, counsel was proceeding to question him with regard to his treatment of Sir John Rolleston, when the judge interposed, saying: "There is no allegation here that the patient was wrongly treated. There is no plea of justification." Mr. Hugo Young, on behalf of the defendant, claimed that there was no reason for the suggestion of malice on the part of Lady Rolleston; what was said was said in her own circle. There was no allegation that the doctor was unskilful or negligent, or that he did anything wrong, and his client did not attempt to escape the consequences of her words on that ground. At the conclusion of defendant's evidence, Mr. Young submitted that the occasions were all privileged. The judge said he should hold that they were privileged; the exaggeration was great, but that did not take away the privilege. His lordship, in summing up, ruled that all three occasions in this case were privileged by reason of the special circumstances. The question for the jury was whether the defendant was actuated by any malice. There had been no suggestion throughout the case that Dr. Davies was in any way incompetent. After retiring for about an hour the jury asked if the verdict would carry costs, and his lordship replied that the jury had nothing to do with costs. The foreman then said the verdict was for the plaintiff, with £100 damages and costs. Judgement was entered accordingly for Dr. Horron Davies for that amount with costs.

We congratulate Dr. Horron Davies on the result. The medical profession is always prepared to make allowances for the feelings of relatives at moments of acute grief, but Dr. Davies was compelled to vindicate his position. In this case the charge was made in a letter written some five weeks after the death, and the verdict of the jury shows that they considered the defendant's conduct unjustifiable.

A PANEL DOCTOR'S SLANDER SUIT.

AT the Devon Assizes at Exeter the action of Gaitskill *v.* Thornycroft and Wife came before Mr. Justice Bray.

Mr. G. D. Roberts, for the plaintiff, explained that the action arose out of certain slanders made by the defendant and his wife concerning the plaintiff, who was a panel doctor attending the employees on the defendants' estate. The allegation was that plaintiff had consistently neglected his panel patients, the innuendo being that he was attending to more lucrative work. These statements would have the worst possible effect on the plaintiff's reputation and standing. Defendants were given an opportunity to apologize. They had now agreed to do so, to pay the costs and other expenses the plaintiff had been put to, and also to pay the sum of a hundred guineas. Plaintiff brought the action in no way to reap a financial advantage, but merely to re-establish his reputation.

Mr. Marks, on behalf of the defendants, said he desired, in the most handsome way, to withdraw the allegation and to apologize. The matters complained of did not affect the defendants personally; they thought the employees on their estate were not receiving the attention from Dr. Gaitskill which they should receive, and they said so. They now admitted that they did not make sufficient allowances, admitted they were wrong, and withdrew the allegations.

The record was accordingly withdrawn. Mr. Roberts stated that the damages and costs had already been paid.

Universities and Colleges.

UNIVERSITY OF OXFORD.

AT a congregation held on June 24th the following medical degrees were conferred:

D.M.—J. G. Priestley, M.C.
B.M.—G. H. Rossdale.

UNIVERSITY OF CAMBRIDGE.

AT a congregation held on June 22nd the following medical degrees were conferred:

M.D.—A. J. W. Cunningham (by proxy).
M.B., B.CH.—H. A. Bell, H. A. Williams.
M.B.—H. G. Wiltshire.
B.CH.—A. G. Williams.

UNIVERSITY OF LONDON.

THE following candidates have been approved at the examinations indicated:

THIRD M.B., B.S.—*Group I:* J. S. Alexander, C. C. Beatty, J. V. C. Braithwaite, F. H. L. Cunningham, M. Erfan, R. E. Ford, J. G. Jones, E. R. Lovell, G. W. R. Rudkin, R. G. Simpson, S. A. T. Ware, E. R. Webb. *Group II:* Ellinor M. Burnett, P. C. P. Cloake, R. C. Cooke, J. J. P. de Chaumont, R. K. Foulkes, R. B. Hawes, E. A. Holmes, V. J. F. Lack, D. M. MacManus, C. T. Maitland, Ruth M. Scutt, K. T. K. Wallington, R. W. Warrick.

UNIVERSITY OF MANCHESTER.

THE following have been approved for the degree of Doctor of Medicine (by dissertation):

J. G. Bennett, R. B. Berry, Mary G. Cardwell, J. W. Crawshaw, *Jacob Holker, R. C. Hutchinson, †E. A. Linell, †A. H. Macklin, R. A. Needham, †F. C. Ormerod.

* Gold Medal. † Commended.

UNIVERSITY OF GLASGOW.

AT a special commemoration and honorary graduation ceremony, held on June 24th, to commemorate the institution of the University in 1451, and to mark the jubilee of the present buildings, the honorary degree of LL.D. was conferred upon Sir R. W. Philip, P.R.C.P.Edin., and Dr. J. Macintyre.

UNIVERSITY OF BELFAST.

THE Senate of the University of Belfast has resolved to confer the honorary degree of D.Sc. on Sir William Whitla, M.P., M.D., in recognition of his eminent services to the University and to medical science.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND.

THE following have been admitted as Licentiates and Members: R. Marshall, U. P. Basu.

Medical News.

THE annual Oxford Ophthalmological Congress will be opened in the Department of Human Anatomy in the University Museum on July 15th by the Master, Mr. Sydney Stephenson. Afterwards a discussion will be held on perimetric methods. The Doyne Memorial Lecture will be delivered on Friday morning, July 16th, by Mr. F. Richardson Cross, who has chosen for his subject "The nerve paths and centres concerned with sight." Full particulars can be obtained from the Honorary Secretary, Mr. Bernard Cridland, Salisbury House, Chapel Ash, Wolverhampton.

DR. ALLEN DALEY, medical officer of health for Bootle, who has been appointed to the corresponding office at Blackburn, was presented on June 23rd by the medical practitioners of Bootle with a silver tea and coffee set, and a signed expression of esteem and goodwill. In acknowledging the presentation Dr. Daley alluded to the very cordial relations which had existed in Bootle between the officers of the health department and the local practitioners.

A COMMEMORATION day, the first for five years, was held at Livingstone College, Leyton, on June 25th. Among those present were the Bishop of Chelmsford (chairman), the Chaplain-General of the Forces, and Dr. and Mrs. C. F. Harford (founders of the college). A number of former students told of many lives which had been saved through the use of knowledge gained at Livingstone College, and emphasized the necessity of all missionaries receiving, before being sent abroad, such elementary training as the College provided.

THE annual general meeting of the Medico-Legal Society will be held at the house of the Medical Society of London, Chandos Street, W.1, on Tuesday next, at 8.30 p.m. Lord Justice Atkin will be proposed for election as president. After the general meeting Dr. Josiah Oldfield will read a paper on the suicide idea and capital punishment.

MR. LAWRIE MCGAVIN begs to thank all those friends who made kind inquiries during his recent long illness. He has now returned to work.

DR. D. N. HARDCASTLE, recently demobilized, has been appointed junior neurologist to the John Leigh Memorial Hospital, Woodbourne, Brooklands, Cheshire.

Dr. Rayner Batten, Dr. E. T. Burke, Sir Bryan Donkin, Sir Frederick Mott, Sir Humphry Rolleston, and Dr. J. H. Sequeira have with regret resigned their membership of the National Council for Combating Venereal Disease. They recognize the national importance of this society and the great value of much of its work, but they have resigned from it "as a protest against its attitude towards the prevention of venereal disease and its failure to make any scientific inquiry into the results obtained by others or by original research and its consistent bias against the subject, as shown by (1) the failure of the Royal Commission to take evidence on the subject; (2) the failure of the medical committee (of the National Council for Combating Venereal Disease) to collect evidence or to report independently on the subject" apart from the non-medical members of the Council. The members who have resigned think it desirable that the National Council should institute a public inquiry into the evidence for or against immediate self-disinfection as a preventive of venereal disease.

THE Professional Classes War Relief Council will continue certain of its activities until next year, at its new offices, 251, Brompton Road, S.W.3. The report presented at the recent annual meeting showed that the amount spent on education during 1919 was over £6,000. Many new applications were dealt with in the General Assistance Department, and the total sum disbursed in all departments was nearly £15,000.

THE council of the London and Counties Medical Protection Society, in view of the increases in charges incidental to litigation, has resolved that a corresponding increase in the amount of the indemnity should be granted to its members. The indemnity is to be fixed at an aggregate sum of £3,000 in any one year, or such other sum as the council may from time to time determine. The cost of providing the increased amount by insurance or reinsurance is to be charged against the Society's special insurance fund.

Mr. S. J. PEACHEY, lecturer in chemistry at the Manchester College of Technology, has worked out in the laboratory there a new method of vulcanizing rubber which is likely to have wide applications. The process hitherto chiefly used has been to incorporate sulphur with rubber by heating to a temperature of about 140° C. Mr. Peachey has proved that by exposing rubber alternately to the action of the two gases, sulphur dioxide and hydrogen sulphide, it becomes rapidly and completely vulcanized at ordinary temperatures. The action is rapid and is a true sulphur vulcanization. During the process leather or shoddy waste can be incorporated with it and the colour of dyes is not affected.

THE students of the Royal Free Hospital are arranging for a fair to be held there on July 10th in aid of the Hospital Appeal Fund. Offers of help will be received by Miss Longbottom, Royal Free Hospital, Gray's Inn Road, W.C.1.

DR. R. W. JAMESON, of Lincoln's Inn, and Major C. J. Marsh, R.A.M.C., of the Middle Temple, were called to the Bar on June 16th.

THE Decimal Association, undeterred by the unfavourable report of the Royal Commission on Decimal Coinage, pursues its propaganda for the use in this country of the decimal system for all purposes. It issues a quarterly publication, the *Decimal Educator*, in which the progress of the movement in various countries is related.

A FATAL case of plague has occurred at Liverpool. The patient was a girl, aged 15, employed in a warehouse in which damaged grain was stored. She became ill on June 14th, and was removed to hospital on the following day. On June 22nd plague was suspected, and she died on June 23rd. The diagnosis has been confirmed by the Ministry of Health bacteriologist.

THE Minister of Pensions having considered the recommendations of the Inter-departmental Committee on Tuberculosis (Sanatoriums for Soldiers and Sailors) 1919, has decided that men suffering from pulmonary tuberculosis, which is admitted to be attributable to or aggravated by service, and who on the conclusion of treatment in a sanatorium undergo a prescribed course of extended treatment combined with training in a training colony, shall be granted pension at the 100 per cent. rate for six months from the date of leaving the colony, and thereafter at the rate corresponding to the degree of his disablement, but not less than 50 per cent. throughout the subsequent period of two years. This award will be subject to the condition that the pensioner presents himself when required, in order that the Ministry may be advised as to his condition from time to time, and as to the need for further treatment. The arrangement will apply also to the pensioner who is not recommended for a further course in a training colony, the 100 per cent. pension in his case commencing as from the date of his discharge from the sanatorium.

THE Ministry of Pensions states, for the information of ex-service men who have suffered the loss of an eye on war service, that Local War Pensions Committees supply artificial eyes, and the arrangements made by the Optical Appliances Dépôt, Clifford's Inn, London, E.C.4, are such that no delay ought to be experienced. It possesses an immense stock of artificial eyes, probably equal to the rest of the world's supply, and an elaborate matching system enables requirements to be met at very short notice. Applications should, in the first instance, be made to the Local War Pensions Committee. In most cases the necessary directions have to be given by local surgeons or hospital authorities, to whom a selection of eyes is dispatched from the dépôt, but in exceptional or abnormal cases arrangements are usually made for the man to visit the dépôt, where he may be fitted within a few hours.

AT a meeting of the West London Medico-Chirurgical Society, held (at the invitation of Dr. A. J. Rice-Oxley, C.B.E., the mayor) in the Kensington Town Hall on June 25th, the president, Dr. Herbert Chambers, being in the chair, the Society's companion triennial gold medal was presented to Colonel T. R. Elliott, C.B.E., D.S.O., F.R.S., for his contribution to the treatment of thoracic injuries during the great war. Professor C. S. Sherrington, F.R.S., delivered to the Society the Cavendish lecture on "Posture." A conversazione and exhibition of medical and surgical appliances and books followed the lecture, and Miss Kimpton's quintet party gave enjoyable music.

PROFESSOR MAX FÜRBRINGER, the well known anatomist of Heidelberg, who was the pupil and successor of Karl Gegenbauer, died recently. His principal work was on the morphology of birds. Since Cuvier no one had made such remarkable contributions to comparative anatomy.

THE production of synthetic rubber in Germany is said to have been abandoned on account of the great advance in the prices of raw material, which renders it impossible for the artificial product to compete with the natural commodity.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2631, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

INCOME TAX.

H. B. inquires as to the position of a married woman holding an appointment in England while her husband is in employment in India.

*** It is assumed that the husband makes no remittances to this country from property or investments abroad. H. B. is apparently entitled to be assessed as if she were a *femme sole*, and to the allowance for her own insurance premium and for the child. The assessment, according to the terms of the Finance Bill now before Parliament, would work out as follows:

	£	s.	d.
Earned income less 10 per cent.	398	5	0
Deduct—Allowance £135			
Child ... ... £36—171	0	0	
	227	5	0
Tax on £225 at 3s....	33	15	0
Tax on £2 5s. at 6s.	0	13	6
	34	8	6
Less £16 10s. life assurance at 3s....	2	9	6
	31	19	0

A. A M. inquires as to the liability to income tax of a person coming here from Australia.

*** Income arising in this country is assessable to income tax however short the residence here. But a person coming for a temporary purpose and in fact not staying in the country for six months in any one financial year is not liable to tax in respect of income *arising abroad*, whether remitted here or not. Assuming that these conditions do not apply to A. A. M.'s residence here, then his liability would be:

	£
For 1919-20:	
On (*a*) Earnings, $\frac{1}{2}$ £600 *plus* $\frac{1}{2}$ £800	= 267
(*b*) Private income from Australia $\frac{1}{2}$ of £500 ...	= 250
	517
less abatement £100 and wife allowance £50:	
For 1920-21:	
On earnings £800, and Australian income £500.	

It is assumed that our correspondent's private income arises in Australia; if it comes from sources in the British Isles it is no doubt already taxed before it reaches him.

LETTERS, NOTES, ETC.

CIRCUMCISION.

DR. S. J. ROSS (Honorary Surgeon, Bedford County Hospital) writes: I notice in the JOURNAL of June 5th, p. 768, a report of a discussion on circumcision. If circumcision be an unjustifiable operation my position is most unenviable, because I have recommended and performed the operation—I shall not say how many times, and for the reasons adduced by Dr. Spencer Sheill, Dr. Solomons, and the Master of the Rotunda. I only disagree with Dr. Sheill upon one point. I operate upon cases occurring in my private practice as soon as the child is born, and without an anaesthetic, and no untoward event has followed. Dr. Tweedy mentions that often alarming haemorrhage occurs. Again I must thankfully acknowledge that in twenty-six years' experience no alarming case of haemorrhage has occurred. I am encouraged by the statement that Dr. Tweedy has only experienced one anaesthetic fatality. With his vast experience of these cases I am certain that he will regard this as a decidedly small fatality, but, of course, we have no details of this case. My experience in the Liverpool Lock Hospital was that it was the uncircumcised who sought treatment for venereal disease. I wonder whether Dr. Tweedy in his evolutionary researches has discovered a use for the vagabond appendix—the abdominal tonsil. I know from experience that the faucial tonsil is more trouble than it is worth. Some time ago I wrote an article on "The rôle played by the tonsils in organismal diseases," and the opinions there expressed have been more than justified by practical experience.

CONGENITAL DIAPHRAGMATIC HERNIA.

MAJOR D. G. CARMICHAEL, R.A.M.C. (in charge Military Families Hospital, Tidworth) sends the following notes of a case in which at birth abdominal viscera had entered the left side of the thorax owing to diaphragmatic defect:

Mrs. S., a primipara, aged 34 years, was confined of a male child, normal labour, full time, at 12.40 a.m. on May 4th, 1920, by a midwife. The infant is said to have cried for some time after birth. The cord was not severed until after all pulsation had ceased. It is doubtful whether the child lived after this—that is, if it ever had an independent existence—but the mother states it lived for several hours. The midwife washed, dressed, and handed the baby to the mother, remarking that it was "a little chesty." The mother took the child into bed with her "to keep it warm," and then fell asleep. When she awoke she thought something was wrong, as the child was so limp and she could not make out if it was breathing properly.

At 9.30 the same morning I was sent for, as they were not sure if the child was dead or alive. I found that rigor mortis had already set in and was present in all the limbs; the body was warm, well nourished, and weighed 6 lb. From external appearances and examination there was no obvious cause for death, so permission was obtained to make a *post-mortem* examination, and the following conditions were found:

The left thorax was filled with the stomach, the whole of the small intestine, most of the large intestine, and the spleen; the left lung had not expanded at all; the right thorax contained the heart and a partially expanded lung. The diaphragm was congenitally deficient on the left side posteriorly, allowing the abdominal viscera to pass through it into the thoracic cavity.

TAENIA VOIDED BY THE MOUTH.

DR. B. W. NANKIVELL (Bournemouth) writes: J. N., aged 34, a demobilized soldier, had been under my care on several occasions for malaria contracted in India, where he had suffered also from tapeworm in 1915; he was then three weeks in hospital. Some months ago he came to me complaining of passing segments of a worm. He looked seedy, was anaemic, had a troublesome cough and night sweats. Examination of the chest proved negative. I dieted and starved him, and after an aperient gave him four capsules, each containing mxv of extract of male fern, to be followed by a purge. This caused a good deal of gastric pain and discomfort and brought away large masses of worm, but not the head. Some weeks later the treatment was repeated, using pelletierin instead of male fern. The result was again unsatisfactory. At the third attempt I gave extract of male fern 3j, with chloroform and mucilage of acacia. The patient took castor oil, but, being unable to get the bowels open, followed this up with a saline, and later on repeated the dose. He then had an attack of nausea and retching, and brought up a *Taenia saginata* (*mediocanellata*) about 3½ yards in length, including the head. Later on he passed some ninety segments by the bowel. I have had cases of round worm voided by the mouth but never before a tapeworm, nor have I come across mention of such in the textbooks.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 37, 40, 41, 42, 43, and 44 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 38, 39, and 40.

THE following appointments of certifying factory surgeons are vacant: Okehampton (Devon), Penygroes (Carnarvon), Wymondham (Norfolk).

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	7	6
Each additional line...	0	1	3
Whole single column	6	0	0
Whole page	16	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.

EIGHTY-EIGHTH ANNUAL MEETING
OF THE

British Medical Association.

Held at Cambridge on June 30th and July 1st and 2nd.

PROCEEDINGS OF SECTIONS.

SECTION OF MEDICAL SOCIOLOGY.

GEORGE E. HASLIP, M.D., President.

INTRODUCTORY REMARKS BY THE PRESIDENT.

THE President, Dr. G. E. Haslip, in introducing the readers of the opening papers, said that he did not think any excuse was needed from the officers of the Section for arranging such a discussion. The question of the State and the future of medical practice was ever before them. Although the State had long required the services of medicine, it was only within the last few years that the fact had been recognized by the majority of the profession. And this fact would be further recognized as the State continued to assume more and more responsibility for communal health. He felt that he must mention that when this subject was first chosen for discussion in the Section of Sociology the late Sir Robert Morant had consented to open it. The medical profession, more almost than any other, recognized how great was the loss to the country occasioned by his death. It was a matter for congratulation that Sir George Newman had accepted the invitation to take his place that morning, for he was the one person who could explain to the public the future requirements of the State so far as the medical profession was concerned. Knowing the different points of view from which this subject could be considered, the officers of the Section thought it well to select openers who should represent the various interests concerned. Any question with regard to the health of the nation affected the whole community, and therefore it was essential that they should have the opinions of lay persons, whom that Section of the Association possessed the right of inviting to its discussions; and a lay voice, representative of labour, would also be heard that morning. If the State was really going to build up any organization for a medical service to the community, all of them had much to learn. The State had to learn from the medical profession, and the profession had to learn from the State; and both the profession and the department of the State concerned must receive the confidence of the public quite independently of political manœuvring and party policy. It was only by such improvement that they could further the health and welfare of the nation.

DISCUSSION ON THE FUTURE OF MEDICAL PRACTICE.

OPENING PAPERS.

I.—THE STATE AND THE FUTURE OF MEDICAL PRACTICE.

BY

SIR GEORGE NEWMAN, K.C.B., M.D., F.R.C.P.

THE CLAIMS OF THE STATE ON THE DOCTOR.

FROM the earliest times the doctor has served the State, but in this country the direct official inter-relationship is not yet a century old. In 1830 the only direct medical interest of the State, as represented in the Government of the day, was quarantine and vaccination. But in 1831 the Government became anxious about the spread of cholera, then moving towards us from Russia, and an advisory Board of Health was formed, cholera dispensaries established, and inquiries instituted. One of the results was a measure of defence against cholera, but, far more important, interest was awakened in the insanitary conditions amid which the mass of the people lived—an interest which was confirmed by the inquiries of the Poor Law Commissioners appointed under the Poor Law Amendment Act of 1834. No statute before that of 1834 had definitely provided for the State medical treatment of the pauper, though from 1536 the sick poor had been differentiated from the able-bodied. The famous Poor Law of Queen Elizabeth in 1601 had required the "necessary relief" of the disabled pauper, and under that enactment a wide and rather indiscriminate practice of medical treatment had in fact arisen. Thus it came about that between 1834 and 1838 the Poor Law medical service emerged as the forerunner of the public health service; in 1839 Farr began his work on medical statistics; in 1847 the first medical officer of health was appointed; and in 1855 a central medical department was established in Whitehall—first, under the Board of Health (1855–58), then under the Privy Council (1858–71), then under the Local Government Board (1871–1919), and, lastly, under the Ministry of Health (1919). These four historical steps in development from the Poor Law origin laid the foundation of the present position of State medicine for the civil community—the Poor Law medical service under 636 Poor Law unions and upwards of 4,000 medical men, the public health service under 1,800 sanitary authorities and 318 local education authorities, with a composite staff of another 3,000 medical officers, the Registrar-General's Department, and the Ministry of Health.

Alongside this entrance of medical men into direct State service there was constantly proceeding a further imposition of statutory duties upon the medical practitioner. Apart from the fact that he may be called upon to undertake official duties in the public service he is liable *under statute* in the following respects:

1. He must certify births and deaths (Births and Deaths Registration Act, 1874), and notify all births within thirty-six hours (Notification of Births Acts, 1907–15); he must notify cases of infectious disease (Infectious Diseases Notification Acts, 1889 and 1899, and special notification regulations as issued), of industrial poisoning (Factory and Workshop Act, 1901), and of verminous children (Children Act, 1908). He must also be ready to vaccinate (Vaccination Acts, 1871–1907), and to certify the removal of infectious cases to hospital (Public Health Act, 1875).
2. He may be called upon to inspect and certify for house disinfection (Public Health Act, 1875, and Infectious Disease Prevention Act, 1890), and be prepared to issue certificates for the removal and burial of dead bodies (Ibid).
3. He may be required to inspect and condemn in regard to nuisances and insanitary house property (Public Health Act, 1875, or Amendment Act, 1907); or inquire into unhealthy or insanitary areas (Housing of the Working Classes Act, 1890).
4. He must know something of the ill effect upon health of dangerous or offensive trades (Public Health Act, 1875), and of unsound food (Public Health (Unsound Food) Regulations, 1908).
5. He must be competent to diagnose all forms of mental disease (Mental Deficiency Act, 1913).
6. He must be available to respond to the requirements of the local sanitary authority for the provision of medical assistance and treatment for the poorer inhabitants of the district in which he lives (Public Health Act, 1875, s. 133).
7. He is liable for a series of duties in regard to workmen's compensation (Workmen's Compensation Act, 1906, s. 8), superannuation, and pension claims (Ministry of Pensions Act).
8. He may be called in by a midwife to assist in cases of emergency (Midwives Act, 1918, Section 25).
9. The Local Education Authority may avail themselves of his services in connexion with the treatment of children and young persons (Education Act, 1918, Section 25).

Lastly, the State has in recent years organized in behalf of the community certain branches of ordinary and special clinical work. The National Insurance Act of 1911 brought 12,000,000 insured persons into medical benefit, at present provided by 12,000 doctors and 10,000 chemists; systematic provision has been initiated for tuberculosis, venereal disease, and maternity and infant welfare; the organized treatment of early mental disease, ophthalmology and tropical disease, and the large questions of orthopaedics and the treatment of industrial diseases are now under discussion; and an ever-widening field of public dispensaries, clinics, and hospitals, has opened before the profession.

CONSEQUENT NEW RELATION BETWEEN STATE AND DOCTOR.

These are profound changes. They divert, in a handful of years, the whole course of applied medicine from its century old pathway. They do not abolish the private medical practitioner, but they bring him into a different relation to the State. Their present and future relation must be confirmed and made good on both sides, for, on the one hand, the profession is conscious of new obligations, both those imposed by law and those imposed by a

sense of what is demanded by the civilization in which they live; and, on the other, the State is conscious, as never before, of the community's need of the profession, and the value of the profession's help if sought on the right terms and given in the right spirit. The greatest need on both sides is understanding. Value is the result of the application of mind to matter. The new problem is for State and profession to come to a realization of the principles which should govern their inter-relation. It is an association peculiarly difficult. For historical reasons the State (which means for the present purpose all authorities, local as well as central, concerned with health) has seen prima facie in the profession a body insistent upon the privacy and individuality of its work, the sanctity of its traditions, the freedom of its engagements. Correlatively the profession has seen in the State an organization apparently devoted to the infringement of these traditions and incapable of putting anything worthy in their place. It has been suspicious and mistrustful of what it considers to be unnecessary intervention. It has feared the imposition of some cast-iron system, some form of so-called "nationalization," the institution of a whole-time civil service, which might in practice make the practitioner of medicine servile, dependent, and fettered.

What can improve this relation? The answer to this question seems to be—a larger measure of understanding by the doctor of the business of central and local government as representing the whole community, and by the State and its officers and representatives, high and low, of the history, development, and genius of professional character. The doctor shou'd know something of the respective functions of Parliament, of the Cabinet, of the Treasury, of the dozen departments dealing with health problems as subordinate to their main functions, of the Ministry of Health (medical and lay), and its Medical Consultative Council. Further, he should know the meaning of the English system of local government; how it has evolved; why the country is subdivided into shires, boroughs, urban and rural districts and parishes, and what the main purposes are of the respective bodies providing for Health, Pensions, Poor Law, Education, and Insurance. For it is only by such knowledge, inspired by the historical spirit, that the doctor can obtain a grasp of the machinery by which and through which he can render his communal service to the State. He will discover, incidentally, the working of some of the great principles of representative government and the guarantees of its freedom.* The layman, what Anthony Trollope, following ancient custom, called "the clerk," besides specialized knowledge of the law and practice with which he is primarily concerned, should learn as much as he can of professional tradition and sentiment, of the scope and opportunity of voluntary work (from the great hospitals downwards) which touches the profession, of professional organizations, and of their history and relation to each other.

Such knowledge on both sides has a direct bearing on the effective working out of the extended relations between the profession and the State which it is now recognized are inevitable. It would enable doctors to understand those necessary and, at first sight, rather remarkable, limitations of Government action, which at present he deems to be merely stupidity. For instance, in official work regard must be paid to uniformity, to a "national minimum," to what is practicable rather than what is desirable, to the restrictions of the law, and to public economy. The layman in his turn will learn why doctors are jealous of their *private* practice, of the system of hospital appointments, of the restrictions of whole-time work under public authorities, of the whole personal nature of their relations with their patients, and of professional honour, integrity, and etiquette. These matters are not mere expressions of idiosyncrasy, prejudice, or narrowness of mind. They have behind them a long history, sound reason, and something of a philosophy. Some of them may be vestigial remains of a dead past; others have come to us, living, virile, and purposive, across 2,500 years from the days of Hippocrates.

The general effect of this suggested change of outlook would be that the doctor became more political in the true Greek sense, and not with any partisan or meretricious meaning, but rather in the sense in which man was described as a political being, conscious and considerate of the community in which he lives; and Whitehall and the local authorities would realize how far short they are of full understanding of the profession, with whom they must work, and of its growing cohesiveness, its quest of truth, and its undying spirit of "love of humanity associated with love of craft."

*I may perhaps venture to commend a perusal of Lawrence Lowell's *Government of England* (2 vols.) or the little volume on *The English Constitution* by Walter Bagehot (in Nelson's Series), and the three new admirable pamphlets on *The Business of Government* (Ministry of Reconstruction, 2d.).

Five Problems Awaiting Co-operation of State and Doctor.

Partly by way of illustration of the application of these general principles, and partly by way of demonstration of their necessity, I propose to mention briefly five outstanding problems which now face the medical profession in its relation to the State. It will be understood that my purpose is to open a discussion and not close one, and that I am speaking wholly in an unofficial capacity.

1. *The Unit of Health Government.*

The present position of local health government in England is like an Egyptian palimpsest, composed of several layers of design lying one upon the other. At the bottom there are the Poor Law Unions, next above them and three times more numerous are the Local Sanitary Authorities, superimposed upon which come the Local Education Authorities (318), then the Insurance Committees numbering 145, and at the top the latest addition, the Local War Pensions Committees. Thus the whole country is mapped out five times over, but the charting has been done by different hands, at different times and for different purposes, and hence arises duplication, overlapping and confusion. There is confusion in areas and authorities, but there is no less confusion in the family. There are five local authorities concerned with maternity and infancy; three with children of school age; six authorities deal with persons of unsound mind or mental deficiency; four authorities are concerned with "sick persons"; three with the aged poor; and five with the able-bodied poor. It is all anomalous, extravagant and redundant, with a result which is ineffective and wasteful. What we seem to need in the abstract is, first, a single unit of health government with necessary subcommittees for particular purposes. The principles which should guide us in devising such a local authority are (*a*) the concentration, as far as practicable, in one authority in each area, of the responsibility for all administration of health services from local rates, with or without Exchequer grant in aid; (*b*) the absorption of the work of the Poor Law and Insurance in a public health service and the use by that service for the whole community of Poor Law medical institutions; and (*c*) the unification in appropriate committees of the local authority of all public medical provision for the sick and infirm of all ages. Clearly, there would be advantage in thus having one authority for all health purposes—for a Poor Law medical service, sanitation, education, insurance, and pensions—and towards unification of this nature many are looking. But the question is large and complex, and there are many considerations to which regard must be paid in prescribing a unit of sanitary government, including its history, size, population, urbanization, character of industry and society, intercommunication, rating, relation to local and central government, and so forth. If a large local unit be contemplated it would be necessary to provide for the encouragement of a consciousness of community of interest and aim in the smaller contributory or constituent divisions, with appropriate delegation of powers or functions in accordance with services to be rendered. The large autonomous body might in that way delegate some of the actual detail work to the more local bodies. If, on the other hand, a small local unit be contemplated, many analogous questions would arise. All I desire to do here is to name the general principle of unification as one to which attention must be given. There is a second, somewhat similar, common-sense requirement, namely, *uniformity of administration*, in all comparable areas. All through the country, and in all departments of State Medicine, there is need for introduction of accepted standards and a larger measure of equalization and uniformity of central and local action. There remains a third principle which the profession must not allow itself to forget, namely, that the local unit of health government

must be *representative* of the will of the people as a whole. It cannot be wholly medical in personnel or in purpose. It must be comprehensive and disinterested. "Our trade our politics" is never sound statecraft.

Now, in devising this reform the medical profession must, in the interest of the State not less than the profession, take their share, exchanging with the layman their views on many points—the nature of the authority, its membership, the question of the co-option of experts, finance, medical participation, the respective functioning of the different local committees, the use and adaptation of existing institutions and their economical arrangement, and the place and character of the domiciliary medical services.

2. *The Extension and Co-ordination of Medical Provision.*

Here again is a pressing problem calling partly for unification and simplification and partly for systematic organization. At present there is inadequacy, unequal provision, and piecemeal effort. We shall never get an ordered scheme in that way. We need a national policy—a programme, so to speak—dealing seriatim with the medical problems of maternity, infancy, children, adolescence, adult life, and old age; with environment of home and workshop; with the prevention and cure of non-infectious diseases as well as infectious; and with the education of the public in hygiene. Here to deal with infancy, and there to neglect it; here to have a "stunt" in venereal disease, and there to provide nothing; here to organize a public medical service, and there to leave all things to chance—is not the way either of science or common sense. Then we require, in much greater degree, to bring together in proper relation the provision of medical treatment in the home, at the clinic, in the hospital, and in the convalescent institution, not for the pauper class only, but for the whole of society. All this means that the profession should help in the consideration of these matters, for, while they constitute only a section of the community of ratepayers, and therefore have only a share in the decision, their knowledge and experience, and the fact that they must in large degree undertake the actual working of any scheme, entitles them to a voice in the form of the scheme. For what sections of the population should provision be made? For what forms of treatment? Under what principles as to availability, adequacy, and payment? What is to be the part or lot of the private practitioner in the undertaking? And, lastly, what does the medical profession say to the concurrent operation of three incomplete and independent public medical services (Poor Law, insurance, and public health), and is it possible to unify their divergent claims? and, if so, what should be the basis of payment and its relative burden on the State, on the local authority, and on the income of the patient?

3. *The Future of the Hospital System.*

A third example of problems awaiting us is that of the hospital position. The number of hospitals in England and Wales in 1915 was reported to be as follows:

	No.	Beds.
General hospitals	594 ...	31,329
Special hospitals	222 ...	13,654
Fever hospitals	755 ...	31,149
Small-pox hospitals ...	363 ...	7,972
Poor Law infirmaries ...	700 ...	94,000

This gives us approximately 2,600 hospitals with 178,000 beds, of which 700 institutions and 94,000 beds belong to the Poor Law. In regard to this Poor Law accommodation three things must be said here: First, it is provided out of the poor rate and for persons in receipt of poor relief; secondly, of the 636 Poor Law unions only 54 possess separate infirmaries (of which 26 are in metropolitan unions), 331 unions have "sick" beds in the curtilage of the workhouse, and the remaining 251 unions have no special in-patient accommodation; and thirdly, a large proportion, perhaps even one-third, of the in-patient accommodation in all the Poor Law institutions is empty. These points are important when considering the practicability of transfer of Poor Law beds to the general community. No doubt from the medical point of view the community stands in urgent need of more hospital accommodation—we have overcrowded hospitals and long waiting lists on the one hand, and on the other inability to build new hospitals and yet many empty Poor Law beds. But the solution is not as simple as it looks, and the situation is complicated by many other hospital problems too often overlooked. Let me name some of them. Is the principle of voluntary financial support to continue in our hospital system, or is the profession in favour of Government aid and some measure of Government control? Ought the hospital accommodation of the community to be allocated by the State in respect of area or type of clinical work undertaken, or ought it to continue to be provided in haphazard fashion? Is the medical and surgical staff to remain honorary? Is it to be a special professional class, or composed in part, at least, of general practitioners? What is to be the relation of hospitals to each other and to contributory clinics, and to the insurance system? How are we to bring about the substantial reform of the out-patient departments which is so greatly needed? Ought we to make provision for paying patients, and, if so, on what basis? Can we fairly provide for the insured and the pauper whilst neglecting to provide for the remaining majority? And, lastly, what can be done to reorganize after-care and the proper convalescent treatment of the patient? These are some typical issues which arise, and they are but illustrations; for their right answers they require medical as well as lay judgement and experience.

4. *Medical Education.*

A fourth subject, and perhaps the most important of all, is an adequate method of medical education which shall equip the undergraduate and the practitioner. The new services of the doctor to the State call for a reconsideration of the whole business of education and equipment. A different kind of doctor is needed in these new times. It is clear he must have no less of the learning and skill of former days, whilst he must also be furnished with an improved training in new subjects, in preventive medicine and in the political science of communal responsibility. We are all convinced that the pivot of the profession is the general practitioner. If he is properly equipped the future is safe. Some specialization of practice there must be, for no man, be his powers what they may, can be master of all branches of medicine. Nevertheless, it is incumbent upon us to recognize that such diseases as tuberculosis and venereal and heart disease, will never come under control until and unless the general practitioner is in a position to deal with them. Much of the special provision which has been made by the State in recent years has been necessary, first, because of the need for institutional accommodation to effect cure, and secondly, because adequate treatment by the private practitioner was unavailable. In my view the State should never take out of the hands of the general practitioner—whether in contractual practice or otherwise—the patient whom he is willing and competent to handle on reasonable terms. The difficulty has been that the practitioner has not been in a position to render the medical service required by the State. It is evident that the solution is dependent partly upon reform in the medical schools—a reform which, happily, is proceeding rapidly—and partly upon adequate arrangements for graduate education for the practitioner, and, may I add, willingness on his part to avail himself of the facilities which are provided. There is much remaining to be done in both directions, but before substantial progress can be achieved there is first considerable apathy to be overcome and a fuller apprehension of the needs of the situation, and, secondly, the further education of the practitioner must include an adequate professoriate, hospital and laboratory accommodation, and proper organization.

5. *The Advancement of Humanism.*

As this Section is concerned with "Medical Sociology," I venture to suggest one other sphere in which the medical man of this new age may put in his oar. It is not only an intellectual or medical advance of which our country stands in need. Closely akin to it there is a social need. Men are great in proportion as they absorb the best life of the world in which they live—its ideas, knowledge, hope, fears, aspiration—and quicken these anew in the minds of other men. As Sophocles said:

> Much is the passing strange,
> Nothing surpassing mankind.

No medical man who is in a right sense a man of the

world can have failed to ponder often on the near relationship which obtains between the practice of medicine and the social life of the people. It has often been said our patients are not "cases," but men, women, and children, each with a separate personality, environment, heredity, and variation, with individual habits, training, temperament, and psychology. We cannot be wise healers of the patient or the community without a large sympathy and a liberal humanism—that fuller humanity with which the Oxford reformers inspired the Renaissance.

We are the witnesses of a strange and rapid transition in the life of the people as a whole, an enlarging franchise and new social complexes. Higher wages, shorter hours of work, increased leisure, high prices and democratic aspirations are not remote from the national health and well-being. The doctor must be the missionary of hygiene—the chief educator of the people in the way of health. In being that, he cannot escape his share of responsibility in the study and handling of many of the medico-sociological questions which surround us—education, recreation, housing, the conditions of industry, sobriety, cleanness of living, the prevalence of venereal disease, prostitution, the penal laws, the causes of certain crimes, the integrity of family life—all such questions concern us, and to fulfil our vows we must be concerned with them. The cultivation of international science, co-operation and amity, should also I think be added. It is essential that we should remember that whilst these issues belong to the warp and woof of medical polity the decisive factor is not medical, and movements in favour of their determination on medical grounds only are doomed to failure. Let me remind you of a famous passage in Huxley's Lecture at Ox ord in 1893 on "Evolution and Ethics." He had been speaking of the cosmic process of Nature and he said (p. 33):

> Social progress means a checking of the cosmic process at every step and the substitution for it of another, which may be called the ethical process, the end of which is not the survival of those who may happen to be the fittest in respect of the whole of the conditions which exist, but of those who are ethically the best. The practice of that which is ethically best involves a course of conduct which in all respects is opposed to that which leads to success in the cosmic struggle for existence. In place of ruthless self-assertion it demands self-restraint; in place of thrusting aside or treading down all competitors it requires that the individual shall not merely respect but shall help his fellows; its influence is directed not so much to the survival of the fittest as to the fitting of as many as possible to survive. It repudiates the gladiatorial theory of existence. It demands that each man who enters into the enjoyment of the advantages of a polity shall be mindful of his debt to those who have laboriously constructed it; and shall take heed that no act of his weakens the fabric in which he has been permitted to live.

These words are even more timely to-day than they were when they were spoken. He added:

> Most men are agreed that the proportion of good and evil in life may be very sensibly affected by human action. . . . So far as we possess a power of bettering things it is our paramount duty to use it and to train all our intellect and energy to this supreme service of our kind.

The claims of the State on the profession have greatly increased owing to the advance of medicine and its manifold applications. A new and closer relationship between them is inevitable. It can be profitable in the public interest only by good understanding. There is something due from each to the other. The profession is responsible for its own contribution—a contribution which consists partly in a correct diagnosis of its own disabilities and the conflicting and prejudicial tendencies within its own body, partly in a fuller understanding of the needs of the State, and partly in readiness to make itself thoroughly well equipped and competent to render the remarkable public service which in this generation has fallen to its lot.

II.—THE CONSULTANT.

BY

SIR WILMOT HERRINGHAM, M.D., K.C.M.G., C.B.

I REMEMBER a lawsuit many years ago in which was involved the definition of a consultant. It was found to be difficult, and one eminent member of our profession declared that he attached no meaning to the term consulting physician but that of a physician who was open to consultation. Still, though it may not be exact, it usually has the meaning of a physician or surgeon who has by study of a special class of cases at hospitals made himself peculiarly skilled therein. Formerly medicine and surgery formed the only two divisions, but in medicine, neurology, the diseases of children, the diseases of the skin, and of the upper air passages, have all been differentiated within my lifetime. In surgery many similar distinctions have been made, and each now forms the practice of special consultants. The consultant has also usually given a large amount of time to the study of his subject, has by his writings advanced our knowledge of them, and has often held a teaching post in some medical school.

There has always, however, been another method of obtaining the position to a greater or less degree. Everywhere in the country some doctors by their skill and care in general practice have so far obtained the confidence of their fellows and of the public that their opinion is sought on difficult cases. Some such men have worked at hospitals as well as in general practice, others have not. Some of them have eventually given up general practice and become consultants only. Indeed, it was in connexion with such a position that the lawsuit I spoke of arose.

Recently the Government has instituted another class of salaried public consultants whose duties will lie with insurance patients and will be partly practical, advising on treatment, and partly administrative, drafting the patient to the institution best adapted to his case. And I gather, further, that the staffs of general hospitals, as they at present exist, may be incorporated into the insurance system and perform on fixed terms the functions which their members now fulfil in private practice.

The first class of men will form a body different from the present consulting class, but if the latter measure is carried out many consultants will be working on fixed terms for the Government, and at the same time on what we may call the arbitrary, or voluntary terms of the present system among their private patients. This may be important because it may gradually introduce us and accustom us to a change in practice which I shall indicate later.

I cannot estimate what effect the Government proposals will have upon the amount of the consulting practice of the present system. I am told that the high rate of wages now obtaining has led to a great increase of consultations among the artisans of the northern manufacturing towns. The artisan may take to the public consultants, and if so private consultations will diminish, but it is just as likely that he will prefer the private system so long as he can pay for it.

In some form or other I think that consultants will not only persist but increase, though I have sometimes heard it said that general practice is now so good that there is less need than there was for a second opinion. The premiss is certainly true, but the consequence does not follow. The general level of practice is so much raised, thanks to the improvement of medical education, that the ordinary man now treats a pneumonia with as much skill as did a hospital physician in former times. There is no doubt whatever that the public is on the whole extremely well attended. But on the one hand, since the advance of special knowledge always keeps well ahead of the general advance, so long as the thrusters go ahead, the line will always be anxious to have their fresh reports, and on the other hand there will always be the sage reflection that two heads are better than one, and the desire to satisfy the anxieties of the patient and his friends.

In fact, the line of skirmishers advancing into the No Man's Land of fresh knowledge is always radiating outwards, and breaking up into smaller groups.

First there is a continual invention of fresh instruments of precise observation or treatment and a continual increase of manipulative skill required to use them. The ophthalmoscope and the laryngoscope both led to the formation of a special body of consultants, and it seems likely that the ureteral catheter may do the same. Wherever, in fact, an instrument is employed which requires that a man shall not only learn its use, but keep himself thoroughly skilled in practice with it, while at the same time it is only needed in a limited number of cases, there you have the conditions for the creation of a class of special consultants. We do not gather grapes of thorns, nor do we seek the opinion of any but a laryngologist in a case of laryngeal disease.

Secondly, there is another class of inventions which call rather for scientific knowledge than skill of hand, but otherwise, like the last, are designed to increase precise

observation. I am thinking of such things as *x* rays and the electro-cardiograph.

Some physicians and some surgeons have an *x*-ray plant of their own, and make their own observations. But as a rule such examination is carried out by men who make it their special work and have become a special class. They are truly a subdivision of the consulting class, but they exemplify the weakness as well as the advantage of such a subdivision. They can show us ocular proof of a diagnosis that without them must remain only probable. Such is the case with stone in the kidney and with some tumours. They can exhibit the form and function of the intestines in a far clearer way than we can reach by other examinations. But in some cases, such as certain diseases of the lungs, they are not able sufficiently to verify the real condition to invest their interpretation of the picture with great weight. In such cases they are still a useful addition to our means, but reach a far lower degree of proof, though not always of assertion.

Mackenzie, who while in general practice founded by his unaided observation the modern school of cardiac study, gave us the polygraph, and others, later, invented the electro-cardiograph. Together they give us a most remarkable record of the events of the cardiac beat, and have added and will add greatly to our knowledge both of its physiology and its pathology. The polygraph has now passed into common use, though when I first possessed one I was greatly puffed up. But the electro-cardiograph is still served by a small circle of priests who deal out to the rest of the world their explanation of its mysterious messages. The whole of cardiac study is a growing point of clinical knowledge by many other means as well, and where such growing points exist a special class of consultants is usually found.

The whole of pathology might almost be cited as an instance of this. Since my day, when it was confined to morbid anatomy, it has added bacteriology with immunity and chemical pathology to its field of work, and now is beginning in problems connected with the circulation and with the nervous system to need the help of physics. A study of the viscosity of the blood and its effect upon the general circulation, is practically a purely physical problem.

In all these branches men are consulted every day by doctors for their special skill, and some of them even deal directly with patients. Judging from my own experience, I should say that is sometimes dangerous to the patient, but every one needs their assistance over cases, and, if not perhaps what is ordinarily meant by a consultant, they form a part of the consulting class by reason of their special study and their special skill. Their position has not been carved out of that of the physician or surgeon, for the physician and surgeon of my day did not know that side of pathology. The increase of a special knowledge first created their class, and now, though the knowledge of bacteriology is widely spread among clinical men, the time needed for the operations of the laboratory oblige the physician and surgeon to turn over the practical work to special pathologists, and the pathologists will always be needed by the physician and surgeon on account of the wider knowledge which their special study gives.

Though, however, subdivision is thus the natural and the necessary process, it is occasionally liable to exaggeration. At one of the clearing stations we received an officer who described himself as an internist. We did not quite know what it meant, but we detailed him to the pneumonia ward in confidence that he must be an expert in that disease. We discovered, however, that he had never dealt with anything but various forms of indigestion, and that his examinations had been confined to test meals.

But, besides the existence of all these different classes, we have to recognize also that in any given case quite a number of different opinions may be required. A case of gastric disease beside the "internist" to examine the contents of his stomach chemically may need an *x*-ray operator and a bacteriologist, and so with many other cases. In fact, the patient no longer can be content with the unaided judgement of one physician or surgeon, however eminent. That gentleman has to ask the help of many others before he can make up his mind.

I am, however, firmly persuaded that important though this additional help is—and my pathological colleagues at St. Bartholomew's will not accuse me of underrating it—the dominating judgement ought to be and always must be that of the clinical physician. No doubt I shall be thought to be prejudiced. But the reason for my convictions is that the reaction of patients to one and the same infection is so different, that we shall never be able to treat the infection alone, and must always consider largely, if not chiefly, the nature of the patient, which is the physician's task. And another reason is that the physician's must always be the final judgement on the action of remedies. He, indeed, occupies the first and the last position. He first observes the phenomena, he calls in the pathologist who carries out a special examination and perhaps even prepares a remedy, but in the end the physician must judge whether that is successful or no.

The point, however, is that the clinical consultant now requires the aid of several other persons, and when we discuss his relation to the patient we shall have to consider how this help can be best provided.

The relation between the general practitioner and the consultant has been only so far altered by this multiplication of offices that he now, like the physician, has many fresh people to consult. He can take his patient straight to someone with *x*-ray apparatus, or he sends a specimen to some pathologist, or even in simple cases to the laboratory of an association, and can if he likes form his own opinion as he did before. Or he can, as before, choose someone whose opinion he trusts, or the patient trusts, and take his patient there. No real change has been introduced in the relative position of the two, and I suppose each side will still occasionally complain of the other, as they always have.

But the complexity of the present state of the consulting class, in which I include all the various persons whom the physician consults, as well as the physician himself, make the relation to the patient something very different from what it was.

At the present time there are two classes who obtain the best treatment that is to be found in the country. They are the very rich and the very poor. The former can afford to pay large sums, and to have not only every requisite but every comfort during illness. The latter are treated in hospitals and are probably the better served of the two. But the middle class, the people of our own level of income, come very badly off. Their means do not really admit of their paying large fees, and yet are too large to allow them to be objects of charity. They are not taken into the hospitals, and yet they cannot afford the charges of a nursing home, of an operation, and of the innumerable accessory observations, analyses, and cultures that both physicians and surgeons require.

Nor is it only a question of money. A relation of mine was lately the subject of a fatal and very painful illness, for the diagnosis of which an *x*-ray examination was needed. He suffered great torture in the transit from the nursing home to the house of the *x*-ray specialist and back again. He was a man of great physical courage, and the effect upon him was the more noticeable.

It cannot be denied that our present system or want of system wastes the patient's money, and puts him to the utmost inconvenience, and sometimes to great distress.

It also wastes everyone's time. Every special test that has to be made, every special examination, every special opinion that has to be asked, means that if the patient is up and about he has to trot round to a different door, and sit about in a different waiting-room, or else send various emanations from his person to another laboratory. Or if the patient is in bed each of these various authorities has to come to him and carry out the necessary details under the worst possible conditions.

The only sound remedy, as far as I can see, is to extend to private patients the benefit and convenience of treatment at a hospital. Paying hospitals are one of the greatest needs of the time. They already exist in various different forms.

In one form, which the fame of some American surgeons has rendered well known, such a hospital is the property of the clinical chiefs, and the numerous staff of clinical and pathological specialists are their assistants, and are paid by them. I only know the Rochester Hospital by reputation, but I believe I am representing its organization correctly. On a smaller scale this system has long existed in Germany.

In London there has long been, in Fitzroy Square, a paying hospital financed by laymen, which the patients

use as they would use a nursing home, and where they are attended by the physician or surgeon of their choice, and make their own arrangements about fees. At St. Thomas's the paying wards are much on the same system.

At Cologne I saw a very good instance of a hospital on what I suppose was the Fitzroy Square system. It was not in connexion with any other hospital, and it was partly founded by benefactors whose names were recorded in the entrance hall. It had three different classes of patients who paid different fees. The first or most expensive class had each two rooms, the second class had one room, and the third were in wards holding six or eight beds. There was a common kitchen and laundry and common operating theatres and accessories. There was accommodation for several resident medical officers and a chaplain, besides of course for the matron and nurses. There was no one who could tell me how the fees were arranged. The building was rather new, and was very convenient.

At King's College Hospital there are paying wards where the patients are only admitted on the recommendation of members of the staff, and are only attended by them. At Harvard the Professor of Surgery is allowed a ward for his private patients in order that he may spend the whole of his time in the hospital. I think that within certain limits his private practice as well as his public is utilized for teaching.

The difficulty with all these places is the expense—both the initial expense of building and equipment, and the current cost. I have not been into any figures, but I imagine that it should not be difficult to provide for the latter, but that if, in addition, interest on capital and a sinking fund have to be provided, the burden is too great. In any case, I think the scale of fees ought not to be a flat rate charged to all persons alike. The rich should be made to pay more and the poor less. The system has such advantages that when once known there should be no difficulty about filling the beds.

If by a great stretch of imagination I could conceive myself founding a hospital I should unhesitatingly adopt the last plan. I should build my general hospital with all its appurtenances, its pathological laboratories, its *x*-ray and similar diagnostic apparatus, and its special treatment departments by baths, electricity, various forms of light, radium, and what not. A part of the general hospital should be the paying block, where the patients would be treated only by my staff. They should be entitled to use the treatment provided for the hospital, and the pathological work should be done in the hospital laboratories. It might be desirable that special laboratories and special pathologists should be detailed for them, so that the public work should not be neglected.

But I should go much further. I should provide offices for my clinical staff in which they should conduct all their private practice. They should come down in the morning to their work just as a barrister goes to chambers, and their whole business day would be spent within the place. I should not charge each patient according to his actual cost, but starting with a differentiation by income I should first make the rich pay partly for the poor, and then pool the fees to make the easier cases pay for the more difficult. I should further divide the fees so that a regular proportion obtained between the wards and the laboratory.

Perhaps in another and a better world I may be able to put this plan into practice. I hardly think I shall see it in this.

III.—THE FUTURE OF MEDICAL PRACTICE FROM THE STANDPOINT OF THE GENERAL PRACTITIONER.

BY

ALFRED LINNELL, M.R.C.S.

THE outlook of a general practitioner on the future of medical practice must of necessity be limited, and he must confine himself to those parts of practice with which he is familiar. There is a feeling of doubt and uncertainty in the minds of many doctors with reference to the future of general practice in this country. The increasing inroads of State control in the region of curative medicine are viewed with apprehension and distrust. While it is generally accepted that preventive medicine is a matter which must be dealt with by the State, curative medicine has, until recently, and with few exceptions, been a personal matter between doctor and patient. The interposition of a third party—namely, the State — profoundly alters the position, and it is essential that any developments in this direction should be very closely watched by the profession. However, some extension of State control appears to be inevitable, and it is for the profession to carefully consider how it can mould that control so as to retain for the doctor that independence of action and personal and confidential relationship to his patient which are so essential. A large majority of the profession are unquestionably opposed to the establishment of a whole-time salaried State medical service, while on the other hand, powerful lay influences are at work in favour of it. A public service of the kind indicated would tend to diminish the sense of personal responsibility, and anything which does this is certainly harmful. The experience of the war showed how too rigid an organization can diminish the sense of responsibility. The problem of the future of general practice consists in a proper dovetailing of a State controlled service into the general scheme of practice. An experiment in this direction has been made in the National Health Insurance Service, and although there are many critics, the panel system holds the field at present and probably will be further developed. In attempting to make any forecast of the future of general practice it will be advantageous to consider the results of the impact of State control on medical practice in the past and to give some consideration to those changing social conditions which must materially affect the general scheme.

In the sphere of preventive medicine the employment of whole-time officers of special training is inevitable, but a closer co-operation between the work of those officers and that of the general practitioner is highly desirable. The administration of the various Public Health Acts has not only failed to attract the cordial and sympathetic co-operation of the general practitioner, but has tended to divorce his interest in the work. This means a deplorable waste of material, and a wiser administration would ensure the fullest use of the services of the general practitioner in the interests both of the public and of the profession. The opportunities to do good preventive work come almost daily to the general practitioner, and he probably does more work of this kind than is recognized either by himself or by the public. If the position of the general practitioner is to develop along proper lines, and the best is to be got out of him in the interests of the public, he must be given a definite place in preventive medicine. Every opportunity should be given him to equip himself in those branches of preventive work which require special training, and he should be employed to do, and be properly remunerated for, any preventive work which he is competent to undertake.

In pre-natal work the general practitioner should play an all-important part, and it is hoped that much greater interest will be taken in this branch of work. The general practitioner has always done a good deal of unrecognized work in this direction among his patients, but not on organized lines; with the advent of organization his knowledge and experience should be invaluable and should be utilized to the fullest extent.

In infancy and up to school age the State supervision is through the agency of the local health authority, who exercise their powers by means of infant welfare centres and health visitors. The family doctor is not brought into any direct relationship with the scheme. The doctor attending the centre and the health visitor refer cases which they think require treatment to the family doctor, but there the matter ends. It is now decided to improve the training and status of health visitors. A definition of their position and functions is certainly overdue. The family doctor should be brought into the scheme of infant welfare and officially recognized. The health visitor reports should be made available to the doctor. In this way a valuable medical history could be compiled to form the commencement of a continuous record.

The position during school age is somewhat different. The local education authority is responsible during this period for children attending elementary schools, and acts by means of school medical officers and nurses. These officers make periodical inspections and report to the

authority. In some areas some forms of treatment are undertaken as well. Recommendations are made to the parents that medical advice should be sought, and the nurses have to follow the cases and report as to results. In some areas the school doctors are general practitioners working on a rota, and this works fairly well except for the risk of men being unavoidably detained and missing their appointments. The whole-time man is more satisfactory from the point of view of administration, but it is hoped that the employment of general practitioners will increase, and no doubt with more experience such a system could be made to work quite smoothly.

From school age to sixteen, or during the period of adolescence, there is no State provision of medical supervision at all. The parents are alone responsible for the provision of medical attendance and supervision. Under the Fisher Act, however, the school age is raised, and presumably the young persons will come under the same supervision as those of the previous school age. Under the Act a very salutary provision is made for physical training. This branch of practice has been much neglected in the past, and it is hoped that an increasing number of doctors will equip themselves in this important part of our work.

After the age of 16 a very large and important section of the community come under the care of the State through the National Insurance Acts and enter the period of free choice. Here the State invades the domain of curative medicine in a very decided manner. There has recently been a reconstruction of the conditions of service and a settlement as regards the remuneration, and although there is room for improvement in certain directions it would be wise to give the reformed system a thorough trial.

That the whole scheme of National Health Insurance has not borne out the extravagant claims made for it at its inception is obvious, but that it has had some good influence on the health of the community is, I think, equally obvious. It has had good results in other directions. It has prevented the exploitation of the profession by lay organization. It has conclusively proved that the old club rates of remuneration were hopelessly inadequate for the work expected, and it has resulted in a greatly increased interest in medical politics on the part of large numbers of doctors and a demand on their part for better opportunities of doing better work. Criticism has come from outside the profession and from responsible quarters. Dr. Addison is reported as saying, on the second reading of the National Health Insurance Bill, 1920: "The medical men, with whom I have had many meetings, have recognized that in many respects, in certain places anyhow, the practice for insured persons has not been so satisfactory as it ought to be, and I hope that under the improved Medical Benefit Regulations, coupled with the assistance which the medical consultants must necessarily give, we shall steadily improve the quality of the service." This is a fair if somewhat crude statement. Other complaints in the same debate appear to be due to an exaggerated and unfortunate sensitiveness on the part of certain persons. The Association of Approved Societies, at their annual conference this year, passed a resolution condemning the panel system as inadequate, and asking for the substitution of a "comprehensive State Medical Service securing to the whole population at the national expense the most efficient and complete service that medical, surgical, and dental science can offer." This is a serious indictment of a system which is admittedly incomplete and does not take into consideration those improvements in the service to which Dr. Addison refers. The motion proposes to revolutionize absolutely the entire system of medical attendance in this country. That the whole population is entitled to a complete medical, surgical, and dental service is undeniable, but the majority of the profession would strenuously resist any system which would disturb the existing relationship between doctor and patient. An improved and extended panel system, with the addition of a specialist and consultant service, and institutional accommodation available to all, could be organized without any undue disturbance of existing conditions and with equal or greater benefit to all concerned. But are not all these criticisms of the panel system somewhat ungenerous? The system was only inaugurated in 1913 and five years out of the seven years of its working were war years, and the profession worked during those years under extremely difficult conditions. The depletion of their ranks by enlistments for service, the extra duties imposed by war conditions, and the extraordinarily serious epidemics of 1918 and 1919, placed a strain on doctors of a most severe kind. We cannot help feeling that the panel system has not been given a fair trial and that judgement should be suspended until the promised improvements are in working order. To this extent the future of general practice is in our hands. We should work the panel system honestly and well and give it a fair trial.

The medical care of the poor under a State system is of much longer standing, and of late has been subjected to severe criticism. It has had to share much of the opprobrium which attaches to the whole of the Poor Law system. It is difficult for those of us who have been Poor Law medical officers for many years, and who have habitually given the same standard of attendance to the paupers as to our other patients, to understand the reasons for this opprobrium. The medical service is, generally, a part-time salaried one. The appointments are for life; the standard demanded by the regulations high. The responsibility of the medical officer is absolute and the service is administered by freely elected bodies; yet all parties seem to unite in condemning the system. Probably in the future some "panel system" will be evolved which will give "free choice of doctor," and in which the local authorities will stand in the relationship of employer.

Of recent years the State has been taking great interest in the question of midwifery. This interest has chiefly centred round the provision of a service of well-trained midwives, and it is the business of the Local Health Authority to supervise the service and see that it is efficient and sufficient. Grants are given where necessary to attain these ends. The only medical service provided is through the Poor Law and by the payment of fees to medical men who are called in by midwives to attend in the statutory "emergencies." "Maternity benefit" by means of a money grant is also given under the National Insurance Acts. The relation of the general practitioner to midwifery is rapidly changing. The provision of well-trained midwives largely subsidized by the State and in many instances by voluntary associations has resulted in a considerable transfer of normal midwifery from doctors to midwives. The time seems to be rapidly approaching when there will not be sufficient normal midwifery material available to enable the younger men to acquire that experience which, in the absence of a more prolonged and thorough undergraduate training, can alone give the necessary facility for coping with the abnormalities which he may have to deal with when summoned by the midwife in the exercise of her statutory obligations. The student's curriculum is already overloaded, and it would seem wiser that the extra training required should be post-graduate. If matters are allowed to drift, it seems certain that the practice of midwifery will become a special branch and be lost to the general practitioner. From a professional point of view there can be no doubt that the provision of maternity homes is an urgent necessity. Every one of us has felt from time to time the necessity of an institution of the kind—one in which we could attend our own patients under the best possible conditions. Social conditions are also tending to emphasize the demand on the part of the public. In the populous centres large maternity hospitals could be made available for the necessary post-graduate training. The ideal to be arrived at in a domiciliary service is the association of doctor and midwife in every case, and the younger men should be encouraged in every way to undertake normal midwifery. The usual form of post-graduate training in the past has been through assistantship with an experienced practitioner who was available in emergencies, and under whose supervision the operations of midwifery could be undertaken and the necessary facility acquired. It would be a great pity if this system were allowed to lapse.

Experience has shown that a great increase in the incidence of venereal diseases is a common result of war conditions. The State, realizing this, has assumed responsibility for the treatment of all classes. Clinics have been established and specially equipped officers have been placed in charge. The rather complicated technique of modern methods of treatment has warranted this development, but with increasing equipment of the general practitioner in this respect the necessity for the employment of special officers will probably cease.

With the return of normal conditions and the improved methods at his disposal the general practitioner should certainly be able to cope with these diseases, and possibly to eradicate them.

The State has inaugurated a vigorous campaign against tuberculosis and assumed very definite responsibilities with reference to treatment. It is an open question whether the attack has been along right lines, and whether the time is not ripe for a complete review. The cordial co-operation of the practising doctor has not been elicited, and in many quarters a feeling of irritation has been engendered. This is unfortunate and could have been avoided. In assuming responsibility for treatment nothing should be done to diminish the sense of responsibility of the doctor towards his patient. The attack should be conducted by his agency. The appointment of tuberculosis officers was probably wise and necessary. They have important consultative and administrative duties to perform. It is on the question of treatment that the difficulty arises. Sometimes a doctor is at a loss to know whether he is responsible for treatment or not. He is possibly responsible for certification, but not for treatment. He is not kept fully informed of the progress of the case during periodical absences in sanatorium. All this could be easily avoided. The consultative function of the tuberculosis officer should be emphasized, particularly on appointment. The "dispensaries" should be "clinics" for consultative purposes, and at every stage the doctor in attendance should be kept fully informed and made in every way responsible. The treatment of tuberculosis by general practitioners in the past was certainly not bad, probably very good considering the means available. In no sphere has the disadvantage of the absence of medical representation on administrative bodies been more apparent than in that of tuberculosis.

The State has assumed responsibility for the institutional treatment of tuberculosis, and in a minor degree for venereal diseases, but it is evident that the demand for a much more general provision of institutional treatment for all diseases is increasing, and this provision will have to be seriously entertained. This demand arises from both professional and social causes. The increasing complexity of diagnosis and treatment renders it imperative that greater facilities and better equipment shall be available to the doctor in his battle with disease, while the increasing expense renders some form of organization imperative. The equipment necessary can be most advantageously provided by the provision of institutions available to all, and in which medical men could attend their own patients. Social factors, such as the difficulty of procuring adequate domestic service in emergencies, also tend to create a demand on the part of the public for institutional facilities. The existing hospitals have done admirable work, but are encountering great difficulties on account of the increase of working expenses, and many can hardly continue their work without some State subsidy. These hospitals are not sufficiently used for teaching purposes. There is plenty of material available in them now being wasted, and they offer a splendid field for post-graduate training. This question of post-graduate teaching is a very important one to the profession. Many attempts have been made to grapple with it, and with varying success. There is urgent need of a State-organized system.

The science and practice of medicine have reached a stage at which it is impossible for the student during his five years' already overcrowded curriculum to equip himself thoroughly for the varied duties he will have to perform in general practice. "Study leave" during the early years of practice is urgently necessary, and financial aid should be given to render this possible. The system of assistantship should be further extended, and a period of assistantship under an approved principal should be a recognized part of a post-graduate scheme. This would be preferable to systematic teaching in the schools by general practitioners as has been suggested, and would give men an insight into the art of medical practice.

Probably no factor will have greater influence in the future on general practice and on the general health of the community than the new form of local health authority which will have to be established. At present health matters are administered by a variety of public bodies. With the assumption of increased responsibilities as regards curative medicine, it will be necessary to reorganize the administration and co-ordinate the work of the various branches. When we consider that existing administrative areas are in many cases quite unsuitable for complete schemes of curative and preventive medicine, we are at once face to face with a very complicated problem. Shall questions of public health be subordinated to the convenience of administration of existing areas, or shall the opportunity be taken of making a clean cut and forming new administrative bodies to undertake new functions in new areas? In other words, shall the new health authority be a committee of an existing body or a new and independent body elected *ad hoc*? There is much to be said on both sides. Existing health authorities are well established and enjoy considerable prestige. They have had experience in some branches of public health work. They would probably greatly resent the establishment of other bodies which would usurp some of their authority. The carving out of new areas with all its complicated financial and other adjustments would be a lengthy and expensive business, but would it not be worth while? There is already considerable difficulty in getting suitable men to interest themselves in council work, mainly on account of the burden of its many and varied interests. The addition of curative medicine with its personal interest would tap a fresh source of supply and probably produce a good supply of willing and interested administrators. Areas should be mapped out of a sufficient size to include a complete service of both curative and preventive medicine, each with its own health authority. In some instances these areas would be coterminous with existing administrative areas; in many this would be impossible. It is hoped that public opinion will prevent future health administrations being hidden away in a corner cupboard of an existing council. In any event the profession should be prepared to take a much larger share in local administration than it has done in the past. The formation of local medical consultative councils with functions analogous in their relation to the local health authority with that of the consultative councils to the Ministry of Health should be strongly urged, and there should be direct representation of the profession in adequate numbers on administrative bodies connected with public health.

The future to which we look forward is one in which the profession will be free to carry out its work with some State supervision but with far greater advantages than at present enjoyed. State interference in curative medicine necessarily means not only the provision of medical attendance for certain sections of the population, with the requisite supervision and control, but the supply of that organization of special services, institutional treatment, and post-graduate training for doctors which is at present lacking and can only be provided by the State. That organization, wisely directed, should have an important bearing on the future of medical practice and provide those opportunities for doing better work which are at present lacking.

IV.—THE FUTURE OF MEDICAL PRACTICE FROM THE POINT OF VIEW OF MEDICAL RESEARCH.

BY

Professor GOWLAND HOPKINS, F.R.S., D.Sc., F.R.C.P.

IT requires less courage now to make large claims for the Laboratory as a factor in medical practice than would have been called for had one been addressing practitioners of the last generation. Even thirty or forty years ago there was, it is true, respect enough for experimental laboratory studies as contributing to medical progress. The scepticism, in this regard, of the first half of the last century had disappeared. Pasteur's influence and all that happened in the remarkable seventh decade of that century had accomplished a revolution in thought. When the Association was last at Cambridge, in 1880, recognition of the importance of Scientific Research was in the air, as will be seen by all who read the address which Professor Bradbury then delivered and the discussions which followed upon it. A member of the House of Commons had apparently just then delivered himself of the opinion that there is nothing scientific in Medicine. The dissent called forth by this public utterance was at least as whole-

hearted then as under similar circumstances it would be to-day.

THE LABORATORY IN MEDICAL PRACTICE.

But in those days the laboratory worker, if he were suspected of posing as an active member of the profession entitled to a personal interest in the progress of a case (rather than an exotic product to be carefully kept in its place), was viewed with suspicion. Above all, it was thought dangerous to allow him too near an approach to the patient. I fancy, indeed, that it still requires some courage to traverse that particular view, though to traverse it is almost my chief aim. Of Medical Research in the narrower, if more important, sense of the term it would be almost impertinent to speak here as an advocate. I shall refer to it later. But there is need, in my opinion, even to-day, to urge that the laboratory should function much more than it has hitherto done in actual practice, and to claim that the practitioner should look upon the medically qualified laboratory worker not as one belonging to a different calling but as a colleague. I would make the claim that a widely extending organization of laboratories, so distributed as to secure much more personal contact than now exists between the practitioner and the scientific worker, should form an essential element in the future efficient medical services which we all hope to see provided for this country. While I shall not make claims in this regard which go beyond my own honest beliefs, many may think that I go too far. Certain of my contentions may even meet with the hearty disapproval of some; but in opening a discussion it is one's business to be provocative.

It would be idle to deny that a wide desire for laboratory help in practice exists in the profession, and has existed for years. Twenty-five years ago I had an inside view of the process of starting one of the earliest of the laboratory associations intended to help the practitioner in diagnosis. The immediate success of this venture made its promoters almost giddy, and its activity during a quarter of a century has been, I believe, uninterrupted. The many other laboratories which now exist as private ventures, as well as those supplied by municipal or other public enterprise, are all fully occupied with investigations bearing on diagnosis, and so too are many university departments which ought, perhaps, to be otherwise engaged. The existing service is in fact wholly insufficient, while geographically the laboratories are badly distributed. What, in my opinion, is the most important consequence of this state of affairs is that the relation of the laboratory to the practitioner is wrong. Communications between them are too much dependent upon the post and telegraph offices. Questions are, as it were, dropped into a slot, whereupon a machine goes through certain motions, and a mechanical answer is returned. This system undoubtedly suffices in certain cases, but is wholly inadequate in others.

Some, I think, are too prone to picture the future of laboratory service as developing only upon the lines of its present activities, which so largely consist of the provision of a dogmatic "yes" or "no" to questions asked in relation with cases of zymotic or venereal disease, or involve the making of histological preparations and the like.

THE POSSIBILITIES ILLUSTRATED.

I could spend much time in illustration of what I myself believe to be the large potentialities inherent in the laboratory as an aid to practice, but I will refer only to a certain narrow aspect of things on the chemical side. The possibilities on this side are less generally appreciated perhaps than those of bacteriology and other more developed branches of pathology. If it be true that chemical studies have hitherto played a relatively small part in assisting diagnosis it is only because in this region the laboratory worker and the clinician have to an exceptional degree worked and thought apart. It is remarkable, indeed, how largely, in general practice at any rate, the use of chemical methods in diagnosis has been confined to mere tests for albumin and sugar in urine. Much earlier information, one may say in passing, and more discriminating knowledge concerning renal failure, can even now be obtained say by simultaneous analyses of blood and urine, and on the same lines a better realization of the significance of this or that case of glycosuria. So, also, to take but one other example out of many, estimations of alveolar carbon-dioxide tension made simultaneously with determinations of the hydrogen-ion concentration. or the alkali reserve, of the blood are

giving fresh precision to knowledge in other kinds of case. These are mere illustrations, but it is important to realize that the so-called micro-methods of analysis can be made really accurate, and that many constituents of the blood can now be estimated without inconvenience to the patient. Much wider applications of such methods will inevitably arise. There is no pathological condition in which metabolism remains normal, and the great majority of such departures from normality are reflected in some alteration, qualitative or quantitative, of the blood and urine. There is indeed a mass of chemical information already available which has never yet been applied as it might be to the needs of diagnosis, but when the number of laboratory workers (which is absurdly small) is increased, and when the stimulus, hitherto lacking, of real contact with clinical material is provided, knowledge and technique available for these particular needs will develop indefinitely.

To keep the same narrow line of illustration (the chemical possibilities are really much wider), I may refer to recent work on renal secretion and nephritis, such as that of Cushny or Ambard, with which many here will be familar. Professor Ambard, like most specialists, may and, I think, does claim too much for his views, but the conception of "thresholds" which he has developed in connexion with renal secretion is probably a sound one, the facts having been confirmed by many workers. The classification of excretives into those with and those without a threshold also has bearings of importance. I refer to this matter here because I believe that a change in the thresholds of excretion, or in the velocity with which this or that substance is excreted, may really long precede the more extreme renal disturbance which leads to albuminuria, and the facts illustrate the importance of simultaneous analyses of blood and urine.

But the importance of blood analyses does not stop here: in the future it will extend to accurate determinations not only of metabolites at present known but to others yet unknown, and knowledge of their significance will accrue. Think how recently we have learnt that disturbance of the parathyroid function involves an increase of guanadin in the blood. Specific events of this sort can already be visualized in connexion with the disturbance of other functions though so little systematic work has been done on such matters.

Chemical methods have the advantage that they can always be quantitative and are largely independent of the personal equation. They can, if necessary, be pushed to refinement. For this reason I am convinced that they will come to play an important part in demonstrating relatively small departures from health. It is indeed in connexion with the development of methods for early diagnosis, a desideratum now much in the minds of the profession, that in my opinion the laboratory is destined to play its greatest part. The smaller the departure from the normal the more refined must be the methods for its detection. Medicine, "preventive" in the sense of knowledge acquired, and treatment applied before a disturbance has grossly asserted itself, will be built up mainly, I believe, on quantitative laboratory methods of diagnosis.

How in connexion with such preventive medicine the individual is to be caught for examination before he recognizes himself as a sufferer it is doubtless hard (and not for me) to say. I notice that when the Association was last here the late Dr. W. T. Gairdner, of Glasgow, speaking at one of the general meetings, admitted that "it might be a long time before the ideal was reached when the public would, without reference to severe or startling illness, consult and duly remunerate the medical profession for such advice as would form a security against the occurrence of serious disease," but went on to speak of the analogy of precautionary visits to the dentist (which, to judge from the speaker's words, were then confined to ladies!), and suggested it might be applied by an educated public to conditions of general health. It will, perhaps, be less unthinkable twenty years hence than it would seem to be now for the middle-aged to pay precautionary visits on behalf of their kidneys as in earlier life they paid similar visits on behalf of their teeth. Refined laboratory methods will certainly then give earlier indications of mischief than are got by merely boiling the urine!

Let me here admit that there may be, has been, and is quackery in the laboratory as well as outside it. One has seen, especially on the Continent, printed forms with blank spaces ready to be filled up in the laboratory, filled up with

various figures for this or that urinary constituent and this or that "coefficient"—figures to be obtained by an analyst often ignorant of their significance, and got from material of imperfectly controlled origin. At the end of such documents there may even be a space for "diagnosis"! A physician who could shift his responsibility in such a way is a worse empiric than he who makes no diagnosis at all.

But the laboratory specialist can be used by the practitioner in a very different way, and without more shifting of responsibility than occurs when any other consultant is called in. One thing is certain—the more personal contact allowed, the more productive the association between the two. A result obtained and discussed may yield suggestions to both. A question asked and answered through the post may end in sterility.

A feeling, once prominent, that in trusting to scientific methods of diagnosis the physician loses his Art is surely unjustified. Logically the position of complete self-reliance was resigned when the senses were first aided by the stethoscope or any other simple instrument. The electro-cardiogram has merely extended, in a perfectly logical way, the use of the stethoscope in heart disease, and all laboratory methods, including even those which are chemical, similarly merely extend the more limited indications of classical physical signs. There is no logic in supposing that the technique of diagnosis should be confined to the use of apparatus which the physician can carry about with him, nor any justification for stopping short of whatever elaboration may yield the greatest degree of certainty in the result.

It may be argued that, as knowledge bearing on diagnosis increases, a more important matter than the multiplication of laboratories is improved education of the practitioner. But as technique becomes more elaborate division of labour becomes more necessary. The healing art with all the additional factors comprised in it, above and beyond technical knowledge, must of course always remain in the hands of the doctor as we now know him. The laboratory worker can have only the most indirect concern with treatment. He can only be a consultant, but he needs the personal contact allowed to other consultants, and perhaps even a little more. With that privilege he may bring a new stimulus to the profession as a whole; without it he is, and will remain, relatively sterile. He himself needs the stimulus of reality, and like other workers needs touch with the problems towards the solution of which his labours are directed.

You will see that I am picturing an individual rather different from the investigator who is working for the future. I conceive of a calling essentially new; almost a new profession, though one still part of the medical profession. It will comprise scientific experimentalists, but experimentalists who are concerned, from a special standpoint, with the progress of an Art—the art of diagnosis. After all, if one comes to think, the radiologist already forms a prototype of such a calling. He was primarily a scientific worker, but his art has from its nature won for him a consultative position and touch with the patient.

My remarks, I suspect, will by this time have evoked that strong dissent on the part of many which I have all along anticipated. I shall be asked, for example, whether I seriously imagine that the functions in diagnosis of the consultant as now recognized—functions exercised because of the possession of great clinical experience—are to be replaced by the activities of individuals who, even if they receive the privileges I have asked for on their behalf, must in the main be out of touch with the human factors involved in every problem of diagnosis. I am not so foolish. The services of the Clinical Consultant are about to become more important than ever.

But I believe in three propositions. (1) The new Medicine if it is to cope with the big problems before it will call for a large expansion in means and methods, an expansion which will involve some shifting of centres of gravity. (2) Medical diagnosis, when it does not deal with the obvious, is one of the most difficult of arts; so difficult that, even now, treatment is applied to large sections of the public without any serious preliminary use of the art. (3) The laboratory holds undeveloped possibilities as an aid to diagnosis if its activities are stimulated by contact with the problems.

I would here express the hope that those who follow me in this discussion will not view the future through the spectacles of the present.

A Scheme for Laboratory Services.

If you feel that all this time I have been in a futile way turning your thoughts away from practical issues, that I have forgotten, for instance, the factor of leisure in private practice, I would ask you to consider all that I have said in relation with the Interim Report of the Consultative Council of the Ministry of Health. The scheme there outlined for laboratory services, though perhaps more moderate than my dreams, and representing, even in itself, an ideal not immediately attainable, will remove from me the reproach of being merely a visionary.

The Report pictures a distribution of laboratories much more satisfactory than that which exists at present, bringing the scientific services much nearer to the door of the practitioner. The scheme offers to the properly qualified scientific worker more or less of that consultative position which, as I have argued, will make him infinitely more useful and much more productive than he could ever be as a detached and isolated individual. The organization of the service suggested provides a definite career and will tempt young men to qualify for that new profession which I have asked you to believe in.

The scheme outlined in the Report is such that it may call for substantial aid from the State, but a consideration may be applied to such expenditure which is more often thought of in connexion with private than with national finance. The expenditure would represent a high-class investment.

I imagine that within such a Laboratory Service as the Report foreshadows a good deal of research would be done, but, as I have urged, it would in the main be research directed towards special practical ends. Before closing my remarks it is proper that I should refer, if only very briefly, to Medical Research in the higher and more generally accepted sense of the term—research directed to the increase of medical knowledge as a whole. It needs, as I have said, no advocacy here, but you may like to discuss its future in this country.

Although for so long it was starved among us, with the passing of the National Insurance Act the State came to its aid with a generosity that was even startling. I think that the work of the Medical Research Committee has justified that generosity. The Medical Research Council, which has just taken its place, is so fortunate in its Charter, its Constitution, and its Secretary, that proper support for research is secured for some years to come. Not everyone has yet recognized how exceptional is the status of the Research Council. Its policy in all essentials is directed by experts with knowledge of and sympathy for research, and though dealing with State funds the Council is remarkably free, and under its charter will always remain free, from the inhibitions of bureaucratic control.

A point of great interest arises in the possible relations between the Medical Research Council and the Scientific Service which is pictured in the Consultative Council's report. Although I think that service would, in the main, have the preoccupations that I have tried to define, it is sure that the great organization of laboratories, suggested in the Report, would form a connecting link between academic research and the activities of practice. Of this the Universities on the one hand, and the Medical Research Council as an organizing body on the other hand, should take full advantage. If only the vast amount of material, statistical and other, which lies dormant in general practice could be tapped for Science the progress of Medicine would be greatly accelerated. How best this desirable consummation can be brought about is a question eminently suitable for discussion.

V.—THE HOSPITALS.

BY

E. W. Morris, C.B.E.

It will be conceded that, in any scheme which has for its object the health of the country, the hospitals must take an important place.

Their importance is not only that they are establishments for the treatment of sick people, but that they are institutions for the study of the causes of sickness, and that they are the training schools for those who in later life are to be the officers of the great army whose duty it

is to destroy sickness and to prevent ill health in all men, women, and children.

In speaking of the position of the hospitals to-day and in order to appreciate the magnificent work they have done it is necessary to look back for a moment to their past history. They were not established to do exactly the kind of work they are now doing, neither were they founded to treat the class of patient they now treat. They were established to give any medical relief possible to such of the community as were described as "miserable objects"—at least, that is how the patients are described in the old minutes of my own hospital. It is not now their aim simply to give immediate medical relief; they must do much more than that. Neither can the patients be grouped into that lowest class, the "miserable objects" of our minutes.

Most of our hospitals, both in London and the provinces, were founded in the eighteenth century. In London there was Westminster in 1720, Guy's in 1724, St. George's in 1733, the London in 1740, Middlesex in 1745; in the provinces there was Addenbrooke's in 1740, Liverpool Royal in 1745, Birmingham General in 1766, Leeds Infirmary 1767, Radcliffe at Oxford in 1770. At that period the scientific equipment for the diagnosis of disease consisted of little more than the stethoscope; the physician entered the ward alone.

Those days are past. He now enters the ward as one of a team, or, at any rate, with a sheaf of papers in his hand—the radiographer's report, the bacteriologist's report, the clinical pathologist's report, the electro-therapeutist's report, the cardiographer's report, and perhaps others. Treatment in those far-off days consisted of little more than rest, shelter from the weather, warmth, and food, *plus* various decoctions and concoctions from the apothecary. Now treatment is as varied and as complex as diagnosis. The patient may be transferred to one or more of many departments, each of which specializes in some small group of diseases; there is the ophthalmic department and the aural department, the venereal, the electrical and the massage, the gynaecological, the dermatological, the cardiac, the neurological; there is hydrotherapy and electrotherapy and phototherapy and radiotherapy and psychotherapy.

Now this increasing complexity of diagnosis and of treatment has had a certain effect upon the hospitals themselves, upon the public, upon the medical students, and upon the honorary medical and surgical staff of the hospitals.

As to the effect, first, upon the hospitals themselves; it has very nearly ruined them. They are suffering from collapse after the overstrain of a period of extraordinary effort. There is a catchword in hospital jargon—"cost per bed." In the old stethoscope days the cost per bed at the London Hospital was £60 per annum. It has crept up from this figure to about £140 in 1913, and was over £200 last year. I see that, once upon a time, it was as low as £24, but that was in 1820, a hundred years ago.

Now, what has the hospital to show for this increased expenditure in the way of benefit to the public? In these days, when every hospital is on its knees crying "What must I do to be saved?" it must be prepared to answer that question.

In looking through my minutes, I find that fifty years ago, when the "cost per bed" was £60 per annum, 10.2 patients were passed through each of the beds; or, to put it another way, each patient was resident for 35.7 days. He is now resident on an average for 17 days, and 21 patients pass through each bed yearly. Can the hospital show any other measure of its usefulness than this doubled number of patients per bed? For instance, are patients who are treated, treated more efficiently? Do they afterwards make better citizens than they did fifty years ago? Does the percentage death rate tell us anything?

The last question can be answered at once. The percentage death rate tells us little or nothing. It certainly has fallen—from 10.7 to 7.7 per cent. of patients admitted in the fifty years. The reason that it tells us nothing is this: that to-day we admit cases for cure that we should not have dreamed of admitting fifty years ago because they were incurable cases then. But now the fighting line has been extended. I see in to-day's list of operations—just arrived as I write—that there are twenty-seven major operations this afternoon, of which eight are extensive abdominal operations. If such a list had been attempted fifty years ago what would have been the mortality? Fifty per cent. at least. Yet such a list is a matter of daily routine.

This brings us to the root of the matter. The modern work of a hospital is not to be measured by figures alone and not by a reduced death rate alone. What then? It is to be measured by the permanently useful and happy lives of those who leave it, and by the useful and happy lives of those who, by the hospital's work, never have and never will have to enter it or any hospital. So we come to this, that our "cost per bed" is up because every bed is a battle area; every forward movement, every new department opened and which becomes a permanently increased charge to the hospital, is another new weapon forged to help in the great fight. Samson fought his enemies with the jawbone of an ass. David slew the Man of Gath with a sling and five smooth stones from a brook. But this simple armament is useless now. Only one giant was ever slain so easily. The giants of disease and the squalor and misery that accompany it must be fought by more costly equipment and by more mighty effort. It is this changed outlook on disease, this determination to fight it and end it, not to suffer it, but to destroy it—this has been the ruin of the hospitals and their glory. The hospitals have given themselves for their country. It is to the eternal honour of the voluntary system that it was the hospitals, voluntarily supported and voluntarily staffed, who first stood firm, refusing to fly, resolving to fight. It is not our full beds, but our empty ones that should be our pride, as the empty beds, not the full ones, in the small-pox hospitals are the crown of Jenner's work, and as the empty beds in our fever hospitals are the proof of the efficiency of our medical officers of health—their greatest testimonial. To-day the hospitals which have been for so long and so often on "full duty" now nervously plead for help themselves; the hospitals who have helped so many through dark days when their names were on the "dangerous list" now see their own names posted up there.

Considering the enormously increased cost of running the voluntary hospitals, I think the time has come when patients should as a matter of duty contribute to the cost of their treatment. For the reasons just given the cost has doubled, and more. Hospitals which could just secure enough voluntary help in the past now find that help insufficient. Hospitals—those fortunate ones which, on account of their substantial endowments, have hitherto abstained from public appeal—now find their endowments all too little, and have to "cry aloud" like the rest of us. But if the public has benefited, as it has, by the efforts of the hospitals, that part of the public which has benefited most directly of all—the patients—should contribute something. We are charging all patients at the London Hospital one quarter of their cost as a "contribution towards maintenance"—that is, one guinea a week. It is not at all regarded as a donation. It is a definite charge, not for the services of physician, surgeon, or nurse, but for coal and food, washing and light. And I cannot help feeling that the Ministry of Health has a moral obligation, although no legal one, to refund to the hospital part of the cost of treating insured patients. Such a method of helping the hospitals at this critical time would afford a means of rendering substantial assistance without endangering the voluntary system, which I hope will continue. I think, too, that beds should be provided in all hospitals for patients who wish to benefit by the advantages of institutional treatment, and who are willing to pay the total cost of such treatment, either personally or by some insurance scheme with private companies.

What is the effect of this increasing complexity of diagnosis and treatment on the medical student? I am not interested in and am not speaking of the medical student who simply enters the hospital to get qualified as quickly as possible with a view to earning money as soon as possible. If the hospital can give him no higher ideal than that, the hospital has missed its duty, and he his vocation. I am speaking of the man who enters medicine with some vision; the man who regards disease as his lifelong enemy, to be studied and afterwards fought anywhere and anywhen; who troubles to learn to use the weapons his predecessors have forged, and to use them skilfully and with the whole object of destroying the destroyer; a soldier, a gentleman of the Guards, not a medical profiteer. What is the effect of this growing

complexity on such a man? While at the hospital it is one of exhilaration; he is proud, and rightly proud, of the increasing fighting power; each new weapon delights him; as gaps in knowledge are filled up, as causes of disease rather than later symptoms are discovered, his enthusiasm for his great profession grows more intense. Then comes the day when he leaves his beloved hospital, starts private practice in a city suburb or a country town. Then comes a terrible surprise. He has been trained to use all the weapons which are to be found in a great hospital. But he is sent into battle with none of them. The friendly bacteriologist is not at hand; the radiographer with his test meals is no nearer than the county town; the clinical pathologist will reply to his question by post—yes or no—but he would like to talk the case over with him, hear suggestions, and learn from his ripe experience.

How is this great defect to be put right? It would seem that at the very time that the hospitals are in despair as to how they can carry on any longer, there is urgent need of multiplication of institutions in all parts of the country, so that the advantages which were at hand when he was a student may be equally available now that he is a doctor—beds in which cases may be watched, laboratories in which research can be carried out, and above all, men, experts in the various branches, with whom he can talk. He wants nothing better than that he should remain a student all his life. And so the difficulty that meets us is not simply to keep the hospitals going, but to found and staff a great many more.

And, finally, what is the effect upon the honorary medical and surgical staff? I have left the most difficult part of the subject to the last, and, as a layman, I refer to it before a body of medical men with very great diffidence. My views are my own personal ones, and in no sense am I speaking in an official capacity.

I will take the plunge. I believe firmly that the day of staffing voluntary hospitals by an honorary medical and staff is passed. I am speaking of the teaching hospitals. Clearly, in the old days the conditions of treating sickness were quite different. The consultant, in his visits to his wards, twice or perhaps three times a week, saw and treated his patients from his own personal experience; he entered his wards, as I have said, alone. Now that has changed. He does not fight disease alone. The fight is carried on by officers of all arms—many new arms. Think for a minute of the steps that led up to his appointment to the hospital staff. He was a student. He qualified. He held the usual house appointments—clinical assistant to out-patients, house-physician, house-surgeon, resident accoucheur, and the rest. Then he begins to get anxious as to his future. He looks up the probable dates of retirement of the hospital honorary staff—which is not very likely to be increased however much the work may increase. He thinks he has a chance, and he has enough money to hang on. He becomes a registrar, and is paid by the hospital a perfectly scandalous wage—lower than the unskilled porter. He is really paid by a promissory note. He finishes his registrarship and still hangs on; becomes a demonstrator in some department—anatomy, physiology, what not. At the long last he is appointed to the hospital staff, an appointment he will hold for twenty or thirty years—for the rest of his working life.

Now, is that a sound system? I say, No. The wonder to me is that such splendid men have been turned out by such a system of selection. There can be no doubt that the honorary staffs of our hospitals are men of the finest character in the world. They made the hospitals. It is a privilege and an honour to know them. But I am talking of a system, not of men at all. And the system is wrong, in my own opinion, for two reasons.

First, that the appointment of a staff for life, and, moreover, a staff rigidly restricted in numbers, ensures only to the few, instead of to the many, the tremendous advantage of being on a hospital staff. And secondly, that the complexity of the study of disease, the multiplicity of departments in combating it, demands more time to be spent in clinical work at the bedside than can be demanded of an honorary staff. Is the walk of a couple of hours twice a week through forty or fifty beds the ideal way of fighting the diseases represented in those beds? Is any disease to be studied and destroyed in that way? Can the bacteriologist, the biochemist, the clinical pathologist carry out researches of any value in that way?

A physician once said to me that two hours was ample to go round his forty beds, as half of them were filled with rheumatism, for which nothing could be done. Of course nothing could be done by that sort of work in investigating the first causes of rheumatism. Sir Robert Morant said to me, not long before he died, that the day of two hours for a round were over; it was two hours per bed we needed nowadays. The centre of gravity of the hospital physician must be in the hospital, not in private practice.

To remedy these things, which I think are evils, the time has come for the provision of a properly remunerated whole-time clinical staff for our teaching hospitals, instead of an honorary staff which only visits the hospital. I am all for upholding the voluntary hospital system, but I cannot see that the payment of the clinician will make them less voluntarily supported and voluntarily managed institutions than they are now, when the bacteriologist, the radiologist, the chemist, the nurse, the house governor are paid.

I would divide the beds into groups, and over each group I would appoint a whole-time—or, at any rate, strictly scheduled time—medical or surgical officer, who should have under him properly paid scheduled time assistants, experts in each branch of the work. I would appoint such a head for five years, renewable by mutual consent. The assistants I would appoint for one year, also renewable; all should be considered "on the staff."

At my own hospital, for instance, we have inaugurated such units experimentally—a medical and a surgical. The medical unit is under the control of a whole-time physician at £2,000 per annum. His first assistant will receive £1,000 a year; his second, £800; his third, £365. Part of the salaries of the first and second are paid by the Medical Research Council. Two resident house-physicians are appointed and a special secretary to the unit, expert at card index registration, useful in the follow-through department, and proper laboratory help will be provided. Out-patients will be seen on two afternoons a week. Proper accommodation in the way of sitting-rooms for chief and assistants are also provided. As, without doubt, medical education will benefit by the presence of a whole-time staff, we hope to receive a grant-in-aid from the Treasury, but it is not primarily an academic unit, and will be paid for from hospital funds, even should such a grant not be forthcoming.

The governors, with the co-operation of the staff, inaugurated these units as an experiment, believing that thereby the study of disease, as to its causes, its treatment, and its prevention, would be benefited. The surgical unit is similar to the medical. It has its own operating theatre, its splint department, and a workshop for making all sorts of appliances. Each unit has about seventy beds. A gynaecological unit is about to be formed.

I think that departments such as these at our teaching hospitals will be the centres from which are to be drawn the staffs of the hospitals to be put up in various parts of the country; and the gain to a general practitioner to have spent a year or more in such a place will surely be great. It will teach him to observe accurately and to record accurately. I would like to see posts found in these units for the doctor in actual practice, paid posts, so that he may leave his practice for a month or more and learn all that is new in any department he is interested in and from a staff which is present at the hospital the whole day long and every day. It is certain that the unit would gain by the information he could bring concerning early stages of disease.

There are those who advocate the running of a voluntary staff side by side with a paid staff. I entirely disagree, and am no believer in what has been called the parallel system. I disagree because I do not recognize the unit as, primarily, an academic unit. I regard it as a group of beds in charge of a whole-time salaried staff, and I believe that the time is coming when all the beds at our teaching hospitals will be under the charge of paid clinicians, and I think this will be better for the patients, better for the students, and ultimately better for the public.

Finance is, of course, the trouble. We hope for some help from the Ministry of Health, but help so provided that it does not fetter strong and full growth, but will leave the great voluntary hospitals free to continue the splendid work which they have carried out for so long—

To undo the heavy burdens and to let the oppressed go free.

DISCUSSION.

The Labour Party's Standpoint.

MR. D. T. JENKINS (Secretary to the Labour Party Health Committee) said that he wanted to consider the future of the medical profession from the point of view of the worker. He himself had been an industrial worker for twenty-five years, and knew something of the difficulties of the worker in obtaining adequate medical attendance and treatment. Until the passing of the Insurance Act it was extremely difficult for the average manual labourer to obtain any kind of medical attendance at all. To-day the average wage of industrial workers was less than £4 a week, or 32s. in pre-war value, and the average family in this country numbered five persons. How could the wage-earner secure for himself and family the things necessary for physical and mental efficiency? He believed that the average age at death of workers in the boot and shoe industry was under 40; in the iron and steel industry just before the war it was under 50. The passing of the Insurance Act had improved matters to some extent, but only in so far as the insured industrial workers were concerned; their womenfolk and children were in the same position to-day as they were before the Insurance Act came into operation. Panel practice, moreover, was not what it ought to be, and institutional treatment of tuberculosis was a dismal failure. He wanted to say on behalf of the Labour party that those who thought with him wanted more preventive medicine rather than more curative; they wanted medical advice made available before breakdown, and not only after breakdown. The Labour party did not want the medical profession to spoon-feed the workers, but to educate them in precautionary and hygienic measures. The profession must give more study to the conditions of the workers' life. Many doctors went into practice in the great industrial centres without any knowledge of the conditions under which workers had to live or of the preventable diseases to which they were subject. Why could not the same research be instituted into other industrial diseases in time of peace as had had such remarkable results in the case of T.N.T. poisoning in the war? The solution he preferred was a full-time State medical service, but the workers did not ask the medical profession to accept such a proposal without the profession having a measure of interest in it and control over it. They did not ask doctors to become civil servants in the usual sense. It had been stated that morning that the very poor could obtain in hospital the very best treatment. But there was not sufficient accommodation available for this to be true. The existing hospital accommodation would have to be multiplied by six. This could not be done by voluntary effort. One alternative was to have paying patients, but that would mean the denial of the poor. The other alternative was State aid, and he for one was anxious that the State should not only come to the aid of existing hospitals, but should provide enough accommodation for every need in all parts of the country. People who were able to pay must not be allowed to occupy free beds. The remedy for the existing position was to have the whole nation insured, and the whole nation bearing its fair and proportionate share of the cost. The medical profession must be fully mobilized in peace as in war to resist disease, the greatest enemy of all.

An American View.

Dr. T. R. BROWNE, of Johns Hopkins University, U.S.A., said that it was unseemly, perhaps, for an American to talk to a British audience on health matters. The conditions in America were in a way very similar to British conditions, although the average wage of the labouring man in the States was very much greater, and perhaps the business men in the States had shown rather more interest in an individual capacity in the subject of industrial hygiene. In the American hospital systems the fact was early recognized that not only were there the two extremes—the free patient, on the one hand, and the occupier of a private room on the other—but various intervening stages. Therefore patients were admitted into the public wards who paid a certain sum, which was practically the cost of their maintenance. Even smaller sums than these were taken, because it was recognized that the self-respect of the patient must be preserved, and that to pay even two dollars a week was better than to be a free patient. There was also a growing tendency to devote part rooms to the use of patients who were not sufficiently well-to-do to take a private room. Many of the American hospitals had State aid, and State aid meant a certain number of automatically free beds at the service of the State. This had worked out well in some hospitals, though in teaching hospitals it did to a certain extent hamper the freedom of the staff. Another development in American hospitalization was a system of group diagnosis, the grouping of half a dozen men, interested in different lines of medical and surgical endeavour, who occupied as many adjoining rooms, and had a common room, and perhaps a single secretary, by whom successively the patient could be seen without loss of time. The private rooms in the hospitals were subject to the same routine as the public wards, and the same organization was used. He felt, however, that none of these things would solve the problems of the future. The increasing complexity of medical diagnosis and practice made more radical readjustment necessary. First, there must be greater facilities for studying the beginning of disease. This meant a fuller appreciation of the out-patient department of a polyclinic. The patient who came to a bed in a ward was a "finished product." It was by getting at the beginning of the disease that the greatest good could be done. The same principle applied to the general practitioner. The laboratory had been a great aid to diagnosis, but, while the laboratory had given, it had also taken away. It had taken away because it had induced in practitioners the feeling that they could lean upon a laboratory instead of upon their own observation and judgement. The general practitioner, if he used the powers he possessed, would be able to recognize disease in its beginnings. Lastly, Dr. Browne urged that the future of medicine lay, not in treatment, but in prevention. The public must be prepared for the reception of scientific ideas in regard to public health and preventive medicine. The object of a physician, after all, should be, not to treat the late stages of disease, but to teach the individual and the nation how to prevent disease, and how to save itself from the economic and physical loss attendant upon the lack of preventive measures.

The General Practitioner.

Dr. ADAM FULTON (Nottingham) said that the success of the general practitioner depended on three things: his capacity, his equipment, and last, and above all, his conscience. The State could help the equipment of the general practitioner by the provision of clinics, instruments of precision, and the advice of consultants. But the State would never be giving all it could give to the general practitioner until it helped him to improve his capacity by means of educational facilities. It was not enough for the State to place machinery at the disposal of general practitioners; what mattered more was the spirit in which it did so. In the Ministry of Health there seemed to be a growing disposition to take the general practitioner by the hand and lead him and help him in his daily work.

Dr. F. J. BLACKLEY (Bristol) spoke from the knowledge and experience gained as a general practitioner among an industrial population in a large city. General practitioners could only become what they should be by having, in the first place, more time; crowded surgeries and urgent calls distracted them so much that sometimes they had to postpone diagnosis, and consequently treatment. More help was also needed. Thanks to his partner the speaker had been able to take a post-graduate course, and his partner and himself, by harmoniously working together, had been able to adopt recent methods in their practice. Finally, the practitioner must have more opportunities for study, so as to acquire the practice of better and more advanced methods.

Mr. E. B. TURNER said that a great deal of modern practice did not reach the level that it should because it had to be carried on in the practitioner's own surgery. The practitioner should be encouraged to visit the patient whenever possible, more especially in tuberculosis. The speaker contended stoutly that the family practitioner who had continually looked after the same persons and families year after year had really done an enormous amount of preventive work.

Dr. H. B. BRACKENBURY said they were just beginning to see in dim outline what the State organization was going to be for the medical services of the future. The details

were of vast importance, and could not at present be filled in. But the essential position in the whole map was occupied by the general practitioner. There ought to be a general practitioner—a family practitioner—for everybody. The consultant and the laboratory were there to help the general practitioner. As soon as the idea began to hold sway that the consultant and the laboratory were there in direct and uncontrolled relationship with the patient, the plan went awry. If the general practitioner were abolished the humanizing element was eliminated. The general practitioner, moreover, worked along the lines of prevention. Through his advice and suggestion, personal and domestic hygiene were established. He was a preventive agent in another sense: he prevented the need for all those big institutions by getting at diseases early. If only the general practitioner could be educated to know more about incipient disease and its progress, he, at the very beginning, in the houses of his patients, could exercise his scientific skill in the preventive direction in a manner beyond what was possible to anyone else.

Dr. NOY SCOTT (Plymouth) said it was obvious that the more the State paid the more would the State control, and "the State" meant ultimately the taxpayer and the ratepayer, and what the control of the taxpayer and the ratepayer meant, those who knew the personnel of insurance and other local committees could realize. The profession must beware how far it gave up its liberty. A representative of Labour had told them that the workers desired preventive medicine. But in factories to-day was it not true that workers sustained accidents and contracted diseases simply because they would not use the means of prevention provided, and that much of the common negligence was due to familiarity? If the Labour party would consent to such control as was exercised over the working classes during the war, disease might be prevented.

Sir KENNETH GOADBY, as one who during the war was liaison officer between the surgeon on the one hand and the laboratory on the other, said that his feeling was that the surgeon and physician rather scorned the laboratory and only asked its aid when the patient, perhaps, was past help. By bringing these together team work had resulted between surgeon and physician and radiologist and laboratory worker which had been of the greatest value. It would be a great advantage if laboratories could be instituted in various parts of the country to which the general practitioner could not only send material for examination, but could himself go in order to do a certain amount of work and gain some insight into laboratory methods. It was only by close association between the man in charge of the case and the laboratory that true research could be carried out. Otherwise there was a tendency for the laboratory to go off on a side issue. The researchers were doing their best to aid in the prevention of disease, and if the Labour party would assist them in disciplining its members, if it would persuade its members that the collection of facts was an advantage to them and should not be impeded, it would be helping powerfully towards that end. The laboratory should be a place where the general practitioner could not merely ask for one examination, but could again take the specimen and ask a supplementary question, the answer to which might prove even more illuminating than the first.

The St. Andrews Institute.

Dr. GIRDWOOD described the institute at St. Andrews established by Sir James Mackenzie for research into the early stages of disease. Sir James Mackenzie's own experience in general practice supported, what a return from the local general practitioners of St. Andrews showed, that about 90 per cent. of the cases they attended in their daily practice were undiagnosable. In part this was due to the early stage at which disease was seen, and in part to the slightness or seeming triviality of many of the cases. A great proportion of those early cases presented no physical signs detectable by present means. The only evidences of ill health in most cases were purely subjective; thus a very common solitary symptom was the feeling of unfitness, tiredness, and exhaustion. The study of early disease resolved itself, therefore, into the study of the patient's sensations of ill health, and the study of the mechanism of production of these sensations was all important for throwing light on the diseases of which they were the earliest evidence. Since these early cases of ill health were seen by the general practitioner (and he alone was in constant touch with them), it followed that the general practitioner must undertake this research. To this end Sir James Mackenzie established his institute at St. Andrews and appointed several general practitioners to the clinical staff. As special investigations were necessary for such work, a bacteriologist, a chemist, and a radiologist were appointed, and laboratory accommodation was provided. Three panel practitioners were on the staff, and used their rooms as their panel consulting rooms. They had the use of the special departments for their panel cases. They kept brief notes on a card index of all their patients, and these in time would form complete health histories of each individual. The general practitioners each devoted two hours a day to research work. On three days a week each practitioner saw one new research case and any other cases for revision or further observation. Each practitioner selected the cases suitable from his own practice for this special examination, which he conducted himself. The special investigations required were carried out by the special departments. Each member of the staff selected and made himself familiar with some special branch of clinical medicine. Any member could consult any other. All research cases taken during the week were read and discussed by the entire staff on Friday afternoons. A provisional diagnosis was arrived at, suggestions for further investigation of the cases were made and noted, and a line of treatment suggested. The cases were then indexed under provisional diagnosis. In order to overhaul methods and digest the material gathered, one afternoon a week was devoted to a discussion, the subject of which was selected beforehand and illustrated from the cases recorded. This compelled members to make repeated analyses and careful comparisons of their cases.

The Essentials of a Medical Service.

Dr. P. MACDONALD (York) believed this discussion to be one of the most valuable ever instituted by any medical body. Sir George Newman had not been very definite in his proposals, and this was probably deliberate and perhaps wise. Reading between the lines of the papers, one found a plea for the assumption of responsibility by the State for the medical services of the community. He was enthusiastically in sympathy with this plea, but he wanted to give a word of warning. Although it was desirable that the State should assume responsibility for medical services, it should do so only on conditions which would allow of the efficient accomplishment of the end sought. If this was not well and efficiently done, then any further incursion by the State into medicine should be strongly resisted. There were three essentials for an efficient medical service: The first was that any medical service should be established and complete; not every section of it would spring into completeness at once, but there must be a general co-ordination from the beginning. The second was that the medical profession should be given the maximum possible control of the service; he would not say the whole control, but the utmost possible. The third was that the provision of medical services must be adequate. Judging by the estimate he had tried to work out for his own city (York), the cost to the State of an efficient medical service would be an increase on present costs of 40 millions a year. Would this be forthcoming from the present Ministry of Health? He believed that not only was the day of honorary staffs in voluntary hospitals at an end, but the day of the voluntary hospital also.

Reply.

Sir WILMOT HERRINGHAM, in replying, wished to endorse the desirability for personal intercourse between the laboratory worker and the doctor in charge of the case. The question of a general State service had scarcely been brought up in that discussion. Mr. Jenkins was its only advocate, though Dr. Peter Macdonald had alluded to it. It was understood, as Dr. Brackenbury had so well pointed out, that the whole profession must be extremely well paid. He thought they were all apt to exaggerate a little what medicine, whether preventive or curative, could do. As for the vast sums which would have to be expended if the medical profession was to be properly paid, it was quite evident that the Labour party was willing to provide the money! And as that generally meant that other people should provide it, there was nothing more to be said.

THE SECTIONS.

BRIEF SUMMARY OF PROCEEDINGS.

ARRANGEMENTS have been made to publish full reports of the discussions in the Sections of the Annual Meeting at Cambridge during the next two or three months. Meanwhile the brief notes which follow will enable those who were not present to gain a general view of the proceedings. Any errors to which attention may be drawn will be corrected in the full report.

SECTION OF MEDICINE.

NERVOUS DISORDERS OF STOMACH AND INTESTINES.

ON the first day (June 30th) Dr. A. F. Hurst, after a few introductory remarks by Sir Humphry Rolleston, the President, read his paper on nervous disorders of the stomach and intestines, arguing that most of them had a hysterical rather than an organic basis. Dr. T. I. Bennett (London) described his work on the digestions of normal students by the fractional test-meal method, illustrated by lantern slides. Dr. T. R. Brown (Baltimore) described the difficulties in standardizing digestive processes and the secretion of hydrochloric acid, and deprecated over-attention to gastro-intestinal symptoms. Dr. W. Langdon Brown (London) illustrated the difficulty of discriminating between organic and functional disease in gastric disorders, correlating the sensitiveness of the nervous system; he also deplored the undue prescription of rigid dietaries. Dr. J. A. Nixon (Bristol) enlarged upon the importance of recognizing the variability in the normals of digestion, and of the frequency with which organic disease is overlooked when the diagnosis of a psychoneurosis is made. Mr. H. Tyrrell Gray (London) discussed the neurological basis of nervous disorders of the stomach and intestines, laying particular stress on the activity of the sympathetic; he thought it essential that the importance of surgical treatment in these cases should not be overlooked. Professor R. J. Buchanan (Liverpool) spoke of the importance of co-operation between physicians, surgeons, and others in the diagnosis and treatment of these disorders; the "psychical" explanation should not be pushed too far, lest organic disease be overlooked. Dr. R. G. Gordon (Bath) deprecated the neglect of the psychical factors in cases of indigestion, for often they were not obtruded by the patients and often were very vague. Dr. W. J. Tyson (Folkestone) dwelt on the practical difficulties of diagnosis in the patients as seen in daily work. Dr. E. Hobhouse (Brighton) endeavoured to clear up the exact meaning of the many terms used, particularly hysteria, psychasthenia, and neurasthenia. Dr. E. Libman (New York) described the importance of sigmoid spasm, as shown by an area of cutaneous hyperalgesia, in gastro-intestinal disorders of functional type, and the importance of abnormal metabolic processes. Dr. Craven Moore (Manchester) emphasized the instability of the nervous system underlying these conditions, at the same time pointing out the desirability of doing everything possible to exclude organic disease of all sorts in them. Dr. R. C. Parsons (Dublin) advocated breadth of view in the diagnosis and treatment of these cases, quoting an illustrative case. Lord Dawson dwelt on the advantages of weakness in the gastro-intestinal tract, *quoad vitam;* and on the ease with which organic disease might be missed in its early stages. Personal psycho-analysis was always to be avoided. Dr. A. F. Hurst cleared away several misunderstandings that had arisen in the course of the discussion, laying stress on the importance of thorough physical examination of all sorts before making a diagnosis, and deprecating undue readiness in recourse to surgical interference. The Section was attended by over 200 members and visitors.

VITAMINES IN CLINICAL MEDICINE.

On Thursday, July 1st, with Professor Bradbury in the chair, Professor F. G. Hopkins (Cambridge) read his paper on the present position of vitamines in clinical medicine. Sir James Barr (Liverpool) threw doubt on the actuality of vitamines, referring to Sidney Ringer's work on the importance of salts, particularly those of calcium, in the metabolic processes of health; and adduced various reasons for his disbelief in vitamines. Dr. Harriette Chick (London) laid down eight requisites for an adequate diet in childhood, basing her remarks on experiences recently gained in Vienna; the connexion between various diseases of childhood or adult life and deficiency in one or other of several of these eight qualities could be traced in very various degrees only with great difficulty and by the exercise of great clinical acumen in many cases. Laboratory work, particularly ideas of quantity, proved of the greatest service in the investigations. Thus, 10 grams of neutralized lemon juice were found to be of more value than 60 grams of apple juice. Reference to the great increase of rickets in Vienna was made, and attributed to food failure. Dr. Elsie Dalyell (London) said that at the age of 4 months 50 per cent. of the children were rickety though breast-fed; at 9 months all children were rickety in Vienna at the present time. Slides were exhibited showing the improvement in health and weight produced by giving cod-liver oil, but without increasing the calorie value of the diet; this proved sufficient to avert rickets. Very few cases of keratomalacia were seen in Vienna; one illustrative case was quoted, of rapid onset with rapid cure by fat and cod-liver oil. Lieut.-Colonel R. McCarrison, I.M.S., referred to the frequency of keratomalacia in Madras, curable by cod-liver oil. He showed a series of slides exhibiting the gastro-intestinal changes and intussusception common in monkeys fed on a diet poor in vitamines; changes in the ganglions of Auerbach were common. Amoebic dysentery occurred in monkeys fed on deficient diets, but not in monkeys kept in the same conditions and with the infective amoebae in their stools while receiving adequate diets. Dr. Hess (New York) dwelt on the details of chemical procedure that might bring about the destruction of vitamines, particularly those in milk. Old samples of dried milk might still contain plenty of vitamines, and so bring about the cure of scurvy in infants. Beading of the ribs he regarded as evidence of scurvy rather than of rickets. Dr. G. F. Still (London) pointed out the difficulty of analysing the dietetic origins of rickets; scorbutic diets, in the same way, did not always produce scurvy in children. Possibly different children required different amounts of different vitamines to keep them in health; or the vitamine content of standard foods might be variable. Dr. Leonard Williams (London) discussed disease in general from the point of view of the dietetic deficiencies to which the community is exposed, mainly as the result of cooking. He recommended intensive vitamine treatment in many conditions such as chronic arthritis; the maximum amount of uncooked food should be taken. Dr. J. C. Drummond (London) detailed the influence of deficiency in the diet of the mother on her progeny; in feeding experiments slight inadequacy of diets produced often a great tendency to attacks of intercurrent disease. Restrictions of diet did not influence the growth of experimental cancer in animals, practically speaking. Dr. Corry Mann (London) detailed some of the difficulties experienced by makers of sweetened condensed milk, and described some of the conditions promoting rickets in the daily life of families about the docks. He recognized a rickety diathesis in 8 per cent. of the cases he had investigated. Dr. W. H. Willcox (London) described the evidence connecting scurvy and beri-beri with dietetic deficiencies in the East among British and Indian troops during the recent war. Dr. Eric Pritchard (London) lauded the efforts of the biochemists in the study of vitamines, but deprecated the idea that rickets could be banished by doles of cod-liver oil; he regarded rickets as a highly complex disease based on malnutrition, and connected with a great demand for calcium by the tissues—a disease of want of metabolic balance. Dr. S. M. Copeman (London) gave an account of the connexion between defective diet and malignant disease, showing that some such thing probably exists. Dr. R. L. Mackenzie Wallis (London) dealt with the importance of providing an adequate diet for the patients in asylums for the insane. Biscuits made of monkey nuts were admirable in beri-beri. Dr. C. Muthu (Wells) gave a general account of deficiency diseases in this and other countries, and the connexion between life and electricity. Dr. J. Brown (Blackpool) put in a plea for a diet of living foods containing electrical energy and aromatic paraffins. The meeting was attended by over 300 members, and the debate was followed with the closest interest and appreciation.

SUBACUTE BACTERIAL ENDOCARDITIS.

On the last morning (Friday, July 2nd), after a few preliminary remarks by the Chairman, Dr. Thomas Lewis, Sir Thomas Horder read his opening paper on the clinical significance and course of subacute bacterial endocarditis, a term coined by Dr. Libman. He was followed by Dr. Libman (New York), who characterized the various types of endocarditis occurring, distinguishing rheumatic heart disease from other types of endocarditis, and particularly from that under discussion. These were due in 90 per cent. of cases to the non-haemolytic streptococcus, the great majority of the remainder being due to the bacillus of influenza. Most often the heart valves showed old and long previous lesions; attention was drawn to the renal lesion—a glomerulo-nephritis with partial involvement of the individual glomeruli. A description was given of the so-called "bacterium-free" stage often seen in these patients, and occurring in something like a quarter of them. Renal deficiency, anaemia, and embolism were the three commonest causes of death; marked browning of the face was not very rare. The prognosis was bad but not hopeless. Dr. Wardrop Griffith (Leeds) discussed the difficulties of diagnosis, from both the clinical and bacteriological sides, between infective endocarditis and the ordinary simple endocarditis. Similarly, acute and subacute infective endocarditis were often indistinguishable, and further definition was wanted. Dr. F. J. Poynton (London) argued that it was necessary to include rheumatic endocarditis in the discussion, on the ground that the blood was not bacterium-free in the early stages. In general he would hold that a rheumatic heart later developing subacute bacterial endocarditis (or progressive rheumatic endocarditis, as he would prefer to call it) had never been free from infection, and that the second disease was a recrudescence of the first. Lantern slides illustrating his points were exhibited. Dr. Carey Coombs (Bristol) described the condition as one of valvular disease, rather than one of carditis as in rheumatic heart disease. He was unable to discriminate between ulcerative endocarditis and the subacute bacterial endocarditis, but agreed that old endocardial lesions were common in these cases. The portal of entry of infection could not be specified; at any rate an effort to lessen rheumatic infections should be made. Dr. A. G. Gibson (Oxford) pointed out the difficulty of identifying small cutaneous haemorrhages individually; search should be made for haematuria from day to day. He also touched on a variety of the clinical signs that might occur in the condition, asking what might be the importance of arrhythmia in these patients. The Chairman defined the diagnosis of petechial haemorrhages, the form being a ring rather than a spot, the location often round the clavicle. He laid stress on clubbing of the fingers as a sign of subacute bacterial endocarditis. Dr. J. Hay (Liverpool) referred to the frequency of the condition nowadays, and its almost invariably fatal outcome. As an early sign he mentioned rapidity of the heart's action; extrasystoles he was inclined to disregard; he also referred to early clubbing of the finger-tips. The diagnosis should and could be made independently of the bacteriologist and biochemist. Particular care should be given to the prophylaxis of the rheumatic infections, which lay with the general practitioner. Dr. A. E. Gow (London) gave a general account of the symptomatology of subacute bacterial endocarditis, and his recent experience was that the bacteria could be recovered from the blood in less than half the cases. He recommended puncture of the spleen when blood cultures proved negative. Leucopenia was not rare; illustrative cases were quoted. Dr. H. J. Starling (Norwich) gave an account of thirty-eight of his own cases, all occurring in the course of military service, from the clinical point of view. The fever he was inclined to attribute to the occurrence of embolism; rheumatism occurred in the history of only a quarter of the patients. Details of the *post-mortem* appearances were given. Dr. J. M. Cowan (Glasgow) sent a communication, which was read; it was pointed out that the rhythm of the heart was not necessarily disturbed. Dr. G. D. Laing (Oxted) dwelt on the difficulties of diagnosis from the point of view of the general practitioner, asking for further indicative symptoms. Dr. Buchanan (Liverpool) asked a number of questions as to the physical signs, and discussed the significance of the morning temperature in these cases and of the interlunar rise in women. Dr. Poulton (London) spoke, and Sir Thomas Horder replied to a number of the points raised. Over 120 members attended the discussion.

SECTION OF SURGERY.

SURGICAL TREATMENT OF GASTRIC ULCER.

SIR GEORGE MAKINS presided over a very large audience assembled in the anatomical lecture room on Wednesday, June 30th, and in a few words welcomed the Section to Cambridge. The discussion on the surgical treatment of gastric ulcer was introduced by Sir Berkeley Moynihan. In his view the disease was a comparatively rare one, and was essentially a secondary disorder. The first efforts of the surgeon were to be directed towards discovering the primary source, which most probably lay within the abdomen or in the buccal cavity; after septic infections of teeth, maxillary antrum, appendix, had been dealt with they were to go on to the essential surgical treatment of the ulcer. Medical treatment had to be much more rigid and spread over a longer time than formerly, and he advocated rest in bed, large quantities of fluid with alkaline drugs rather than starving. When medical treatment thus extensively tried had failed, surgery must step in. Gastro-enterostomy had come to be the favourite operation, and it had given him excellent results where the ulcer was small and situated in the lesser curvature, poor results where the ulcer was large and adherent to the pancreas, and bad results where carcinoma had developed in the base of the ulcer. He had abandoned gastro-enterostomy in the treatment of gastric ulcer because, to his mind, the results were not good enough for modern surgery. It was now really only the second-best method. Excision of the ulcer along with gastro-enterostomy was a good method. But he now believed that partial gastrectomy was the operation likely to give the best results provided the ulcer was one suitable for operation at all. He briefly described the technique of the operation, and gave his statistics to show that the ultimate results amply justified this radical procedure. Dr. Charles H. Mayo narrated the experience of the Mayo clinic. In 95 per cent. of the cases the *x*-ray picture could distinguish between gastric and duodenal ulcer. There was a lowering of the free acids, and an increase of the combined acids. Gastric ulcer was potentially malignant. He discussed the operative technique, and was of opinion that destruction of the ulcer along with gastro-enterostomy was the surgical treatment. The discussion was carried on by Mr. Herbert Paterson (London), who urged his well-known views on the question as to whether gastro-enterostomy was physiological or mechanical in its effects; Mr. Burgess (Manchester), whose choice of operation was combined excision of the ulcer with gastro-enterostomy; Mr. Charles Ryall; Dr. Finney (Baltimore), who put in a plea for his own favourite child pyloroplasty, on the ground that through the large stomach opening its inner surface could be thoroughly examined; Mr. Billington; Mr. Rowlands; and a few words were added by the President of the Section. Sir Berkeley Moynihan, in his reply, twitted Mr. Paterson for his devotion to the goddess Hyperchlorhydria. Mr Kidd's paper on the treatment of stone in the pelvic portion of the ureter indicated how frequently such stones could be got rid of by operative cystoscopy, as by slitting the ureteral meatus for three-quarters of an inch and injecting oily or anaesthetic substances they could frequently be coaxed into the bladder. He urged that stones might thus be left for six to twelve months and if they did not find their own way out of the ureter, then the open operation could be performed. In regard to the latter he preferred a small muscle-splitting incision in the lateral aspect of the lower abdomen, pursuing the stone extraperitoneally. Mr. Jolly maintained that the number of stones removable by the method recommended by Mr. Kidd was not large. He had had excellent results from the open operation by the middle-line incision, having had twenty-three cases without a death. Mr. Grey Turner, Mr. Rowlands, Sir Hamilton Ballance, and Dr. Charles Mayo also contributed to the discussion.

In the afternoon demonstrations were given by Mr. Gillies and Mr. Cole on the plastic surgery of the face,

illustrated by military cases brought from the Queen's Hospital at Sidcup and by cases showing the results of plastic surgery in lupus and syphilitic destruction of the nose and palate. Mr. Gillies also showed a patient suffering from extensive cleft palate who had reached the age of 16 without operation, in whom he had repaired the soft palate only by a new method, leaving the gap in the hard palate to be closed by an obturator. Another demonstration was that by Major Sinclair of his methods of treatment of fractures. A large hut was fitted as a hospital ward, and all the now well-known apparatus—the frame bed with net, modified Thomas splints, Balkan frames with pulley and weight arrangements, the "skate" footpiece, and arm splints—were shown on patients precisely as in actual cases. The demonstration was exceedingly well carried through, and followed by a large and intensely interested company. It was generally remarked that the first day's work in the Section of Surgery was the best and the greatest in scientific and practical interest of any in recent years.

CANCER OF THE RECTUM.

The surgical treatment of cancer of the rectum attracted a large attendance at the Section of Surgery on Thursday, July 1st. Sir Cuthbert Wallace presided during the greater part of the meeting after the President, Sir George Makins, had introduced the first speakers. Mr. Ernest Miles dealt with the various modes of spread of the disease, and showed how local increase in size was of less importance than the glandular infection, which was generally recognized as developing in three ascending zones, and it was this metastasis which constituted the difficulty in operating. It was as important to remove glands discoverable near the common iliac vessels as it was in the analogous case of cancer of the breast to clear the axilla and its contents. He showed by a series of diagrams thrown on the screen how, as the glandular geography came to be known, the scope of the operation came to be widened, and how he was forced to regard the abdomino-perineal operation as the only radical one. Mr. Grey Turner (Newcastle) pointed out that the treatment of rectal cancer could never be considered satisfactory as long as the disease was so far advanced as to necessitate operations which left an incontinent anus. Improvement could only come through much earlier diagnosis and surgical operation following upon it. He regarded the thorough removal of the growth and surrounding tissues, with 2½ in. of uninvolved bowel above and below, as more important than removal of the upward invasion path. In his view the best operation was exploratory laparotomy with colostomy followed by sacral excision. The discussion which followed proved to be lively and of interest, exhibiting some divergence of view as to the extent of the radical removal of the rectum. In the opinion of some surgeons the operation advocated by Mr. Miles was upheld, others maintained that some less extensive procedure gave ultimately as good results; one school urged that an inguinal artificial anus was essential, another held that every effort should be made to preserve the anus with sphincteric control in its proper situation. Mr. Lockhart Mummery (London), Mr. Burgess (Manchester), Mr. Ryall (London), Dr. Brown (Ipswich), Sir Hamilton Ballance (Norwich), Dr. C. H. Mayo (Rochester, Minnesota), Sir C. Gordon Watson (London), Mr. Jocelyn Swan (London), Mr. D. P. D. Wilkie (Edinburgh), and Mr. Hamilton Drummond (Newcastle) contributed to the discussion and the openers replied. A short paper on glaucoma was afterwards read by Lieut.-Colonel Elliot, I.M.S.(ret.). He dealt with the ophthalmoscopic evidence of increase in intraocular pressure, the uses of mechanical tonometry, the examination of the light sense and the importance of accurate measurement of the corneal diameter. In the discussion some difference of opinion was expressed as to the dangers of employment of the tonometer. Dr. Wallace Henry, Mr. Wherry, Vice-President of the Section, and Dr. Antill Pockley (Sydney) contributed to the discussion of this subject. In the afternoon Major Sinclair's very able demonstration on the treatment of fractures was repeated, and Colonel Elliot followed up his paper on the diagnosis of glaucoma by a demonstration on the same subject given in the Anatomical Theatre.

DEMONSTRATIONS.

Endoscopy of the Lower Air Passages and Oesophagus.

Mr. Herbert Tilley, in the course of his demonstration on Friday afternoon, July 2nd, gave a brief summary of the history of the direct examination of the lower air passages and oesophagus as compared with indirect examination by means of light reflected from a laryngeal mirror or laryngoscope. He demonstrated Brüning's endoscope, which, he said, was a great improvement on Killian's original instrument in that it provided 50 per cent. more illumination and a larger field for the manipulation of instruments. In both of these instruments the electric lamp and its carrier are near the proximal end of the tube which is passed into the lower air passages or into the gullet. He then showed a number of tubes devised by Chevalier Jackson in which the small electric bulb is at the distal end of the tube, and the advantages of this over proximal illumination were demonstrated. Mr. Tilley showed a number of foreign bodies he had removed from the lower air passages and gullet by means of the direct method, and warned his hearers of the dangers of blind probing, bougieing, and the use of "coin catchers." The direct method had, he said, revolutionized the treatment of foreign bodies in the gullet and air passages, and it was now being employed frequently as a method of examination, diagnosis, and treatment in pathological conditions of those regions. The indications and contraindications for the employment of the direct method, the preparation and the position of the patient, and the question of local or general anaesthesia were also touched upon. Finally, Mr. Tilley passed a tube into the trachea of a patient under the care of Mr. Arthur Cooke of Cambridge, and some thirty of the audience were able to inspect this region and look into each main bronchus. In a second case—a patient with malignant disease of the larynx—the clinical aspects were almost as readily visible as if it had been on the tongue or lip.

On the same afternoon, in connexion also with the Section of Surgery, Mr. Arthur Cooke and Dr. J. W. McNee gave an interesting and instructive demonstration of the technique of blood transfusion, in the experimental room of the Pharmacological Department. Mr. Arthur Cooke showed the direct method with Kingston's tube, and the citrated method with Robertson's bottle; Dr. McNee demonstrated the selection of donors for blood transfusion whereby they are classified into the four groups of Moss. Major Sinclair, in the large shed which had been fitted up as a ward hut in the grounds of the medical schools, again demonstrated his treatment of fractures, and completed this with a lantern exhibition showing the results obtained by his methods.

SECTION OF NEUROLOGY AND PSYCHIATRY.

EARLY SIGNS OF NERVOUS DISEASE.

THE opening meeting of the Section of Neurology and Psychiatry, held on Wednesday, June 30th, with Dr. Lewis E. Shore in the chair, was well attended by members, and the excellent discussion on the opening paper by the President of the Section (Dr. Henry Head, F.R.S.) showed the widespread interest taken at the present time in nervous disease. In his paper on early signs and symptoms of nervous disease and their interpretation Dr. Head considered the subject under three headings: (1) history, (2) nature of early signs, and (3) interpretation and diagnosis. The fact that in hospital practice inquiry into the history of the development of nervous disorders is left, as a rule, to inexperienced clinical clerks is greatly to be regretted, for this part of the investigation is of fundamental importance, especially in dealing with the early stages of disease. Early symptoms are often unobtrusive and transitory, and may have impressed themselves so little on the mind of the patient that they are remembered only when a precise and detailed account from the patient is insisted upon. Many of the early signs of nervous disorder manifest themselves in mental spheres only. For example, there may be changes in personality and conduct, memory defects, such as amnesias, disturbances of sleep, and headache. Certain forms of headache can be clearly

distinguished, and are of great importance in diagnosis. Dr. Head was insistent on the fact that diagnosis was a threefold process: First, there is the determination of the disturbance of function; secondly, the translation of such disturbance in terms of the locality of the structural lesion; and thirdly, the nature of the underlying pathological process. All such names as "tabes dorsalis" and "general paralysis" should be avoided. They do not denote diseases in the strict sense of the word, but are merely "shorthand titles for groups of signs and symptoms evoked by the action of the *Spirochaeta pallida* on different structures of the central nervous system." Dr. James Collier, Dr. Gordon Holmes, Dr. F. M. W. Walshe, Dr. Theodore Thompson, Sir Frederick Mott, Dr. Hildred Carlill, Dr. Williams (Washington, U.S.A.), Dr. Clark, Dr. Devine, Dr. Grainger Stewart, Dr. Farquhar Buzzard, Dr. Lowson, Dr. Percival, Dr. Helen Boyle, Dr. Bedford Pierce, and Dr. Goodman took part in the discussion. Dr. Head replied. In the afternoon Dr. J. G. Greenfield demonstrated sections of peripheral nerves at different stages of regeneration, Dr. Prideaux psycho-galvanic reflex reactions, and Dr. Scripture speech registration in nervous diseases.

Dementia Praecox.

At the meeting of the Section of Neurology and Psychiatry on Thursday, July 1st (Dr. Henry Head, the President, in the chair), Dr. Bernard Hart opened the discussion on dementia praecox and its relation to other disorders. "Dementia praecox," he said, "constitutes without doubt one of the most important problems in public health with which modern medicine is confronted." The nature and causation of the condition had still to be made known, and even the question as to whether or not it was a definite entity had not been adequately solved. Until the mystery surrounding the etiology and character of the disorder was cleared up prophylaxis and curative treatment would be impossible. To Kraepelin we owed the first clear formulation of dementia praecox as a definite disease. He noted that there was a group of adolescent patients suffering from mental disorder which tended to run a more or less clearly defined course, ending in mental enfeeblement. The clinical pictures presented in the earlier stages varied considerably, but nevertheless there were certain features common to all. These were a "weakening of the emotional activities" and "loss of inner unity of the activities of intellect, emotion, and volition." Kraepelin's conception had been much disputed, but it was now generally recognized that it was adequate, in so far as it marked off a group of cases with notable similarities in their symptomatology, course, and outcome, although the group could not be accurately delineated. As to the nature of the essential morbid process in dementia praecox, three principal views were held at the present time: (1) Physiogenic theories, maintaining that the pathology was essentially physical; (2) psychogenic theories; and (3) theories attempting to combine both these view-points. Physical alterations occurred, especially in the advanced stages of the disorder, and were found chiefly in the reproductive glands (Mott) and the cells of the central nervous system. On the other hand, the researches of Freud and Jung showed that psychogenic factors were of the greatest importance. Freud regarded the symptoms as the result of psychological mechanisms similar in kind to those he had found to exist in hysteria, and the compulsion neuroses. Jung looked on dementia praecox as due to a failure of adaptation to the actual environment, and a consequent depression of the psychic energy to more primitive modes of adaptation. In conclusion, Dr. Hart expressed his own belief that any adequate formulation of the problem must combine both physiogenic and psychogenic aspects, and this could best result from a consideration of the disorder of dementia praecox from the point of view of biological reaction. Sir Frederick Mott, Dr. Devine, Dr. Archdale, Dr. Stanford Read, and others took part in the discussion. In the afternoon at 2.30 Sir Frederick Mott discussed the pathological changes in cells of the central nervous system, and in the reproductive glands in dementia praecox. Dr. Henry Head and Dr. George Riddoch demonstrated sensory alterations in the hand from cortical injuries, and Dr. Buzzard and Dr. Greenfield the pathological changes in the nervous system in encephalitis lethargica.

Psychotherapy.

On Friday, July 2nd, a discussion on psychotherapy was opened by Dr. T. A. Ross, who approached the question under three headings: (1) The method of persuasion and explanation, (2) psycho-analysis proper, and (3) methods in which both are employed under different conditions. Much of the animosity evident at the present time in the medical profession in regard to the treatment of functional nervous disease was, he said, the direct result of limited experience. Difference of opinion was healthy, but bitterness and the imputation of unworthy motives succeeded only in clogging progress. For one group of workers psycho-analysis was the only rational method of treating all psychoneurotics, while for another this practice was not only useless but actually so dangerous that it should never be employed. But if the problems concerned with the treatment of functional nervous disease were approached in a non-partisan spirit it became evident that for certain groups of cases mental analysis formed the only method by which the essential cause of the trouble could be revealed and dealt with, and for other groups simpler methods, such as persuasion, were all that was required to bring about successful results. It must be remembered, however, that in the past persuasionists had been too easily satisfied with their results, and had tended to think that when others cured a manifestation *they* cured the whole disorder. Analysis, Dr. Ross continued, was not synonymous with anamnesis, for it always implied the bringing of a repressed and unconscious constellation of ideas into consciousness. The main difference of opinion between the middle school and the rigid analysts was based on the extent of the procedure which was necessary in the majority of neurotic subjects. The followers of Freud invariably delved deeply into the unconscious because they attributed any early improvement that might occur to unstable conditions such as transference of affect from patient to physician. They were led to a scepticism of this kind by their belief that psychic energy was always kinetic. Dr. Ross considered such a hypothesis fallacious. Psychic energy might be potential or latent, as physical energy was known to be. From this premiss he argued that analysis need not necessarily be complete in order to help the patient to a mental readjustment to ordinary affairs of life. Indeed, attempts at complete analysis might increase the maladjustment and so do harm. Dr. Aldren Turner, Dr. A. F. Hurst, Dr. Bernard Hart, Dr. Crichton Miller, Dr. Thom, Dr. Williams, Dr. Maurice Nicoll, and others took part in the discussion that followed.

SECTION OF PATHOLOGY AND BACTERIOLOGY.

Atrophy of the Liver.

At the opening session on Wednesday, June 30th, the President, Professor Lorrain Smith, outlined the scope of the discussions. Pathology was, he said, becoming more and more divided into special branches, and one person was not able to devote himself to every branch. At the same time the subject was essentially one. Morbid anatomy, bacteriology and experimental pathology supplemented each other, and each problem had to be attacked from every point of view. Complete solution was not possible by investigation along one line alone. Laboratories were too often equipped only to assist the clinician. When a diagnosis had been established the matter was dropped, and no study was made of the fundamental conditions which produced the disease. The pathologist should be in a position to make a complete investigation of disease, and reconstruction of pathological departments should be attempted along these lines. Dr. Miller and Dr. Rutherford (in the absence of Dr. Stuart McDonald) said that from a study of 15 unpublished cases three types of acute yellow atrophy of the liver could be distinguished: (1) The acute type characterized by more or less complete destruction of liver cells. (2) The subacute, in which there was well-marked vascular and inflammatory cell reaction. (3) A type in which regeneration was the predominant feature, and the end picture resembled that of cirrhosis. Multiple nodular hyperplasia was the term by which it was proposed to speak of this type. Cases were then described and sections shown to demonstrate the nature and distribution of the lesions in the liver. From the etiological standpoint the most striking feature was the variety of conditions which

precede the yellow atrophy. The chief were tuberculosis, syphilis, typhoid and influenza. Many cases presented a number of possible causes. In one instance a patient had suffered from scarlet fever, acute rheumatism, syphilis, tubercle, and influenza. It would seem that in some cases a single factor was responsible, in others multiple factors. Dr. Spilsbury said that there were many acute processes in which, though a patient recovered from the immediate effects, he might succumb to atrophy of an organ due to pressure of scar tissue. Such conditions in the liver were cirrhosis, chronic perihepatitis, and congenital syphilis. In acute yellow atrophy the essential lesion was a destruction of liver cells, and it was seldom the patient survived to reach the cirrhotic stage. Poisons such as T.N.T. and tetrachlorethane produced both acute yellow atrophy and cirrhosis, but more usually the patient succumbed in the acute stage. In the latter case there was widespread necrosis of liver cells. In the less acute forms liver regeneration was interfered with and prevented by the formation of scar tissue, which also brought about further atrophy of liver cells by its contraction. Dr. Foulerton spoke on fatty changes in the liver caused by various poisons. He considered acute yellow atrophy an unsuitable term, as it only represented a stage in the morbid process. The fat was in the liver and was due to accumulation of unchanged fat in the food, and not derived from the liver cells. The investigations were based on a series of cases of poisons affecting the human liver and on animal experiments. In experiments the kidney as well as the liver was engorged with fat and nephritis was produced. The poisons which affected the liver were all soluble in fat or were fat solvents, with the exception of arsenic, antimony, and mercury. Poison was fixed in the circulating food fat, which was carried to the liver in order to be metabolized. The liver therefore received an accumulation of the poison, which rendered it unable to deal with the fat. The fat then passed on to be excreted by the kidney, which became poisoned in turn. As regards arsenic, the latest work seemed to show that it had some affinity for fat in the body. It was stored in the tissues for long periods, and analysis showed that the fatty organs contained the greater part of it. Colonel William Hunter, C.B., spoke of acute yellow atrophy in the course of epidemic jaundice and in salvarsan poisoning and delayed chloroform poisoning. What had struck him was the frequently sudden onset and complete simultaneous necrobiosis of the liver cells, accompanied by fatty changes in the kidney and heart. He considered the fatty change to be due to cell degeneration and the appearance of fat which was previously present in a soluble form. The poison affected every cell in the body simultaneously. If portal blood passed unchanged through the liver, toxic symptoms supervened. In his view the phenomenon of acute yellow atrophy could be explained by the reduced activity of the liver, which allowed its proteolytic ferments to digest its own cells. Dr. Matthew Stewart confined his attention to etiology and morbid anatomy. In his series some cases were idiopathic, others were due to T.N.T. and galyl. In T.N.T. poisoning only a limited number of cases got toxic jaundice. It might be due to the ease with which some people absorb T.N.T. through the skin, but this did not account for all cases. Probably personal idiosyncrasy was responsible. As regards morbid anatomy, the lesions were similar, however the condition might have been brought about. The changes in the acute and chronic cases were described. An account was also given of patients which had recovered. Their subsequent histories showed that recovery might be complete. Dr. McNee spoke of spirochaetal jaundice, and described the various changes met with in the liver, which included cell destruction and regeneration. There was no evidence of any fatty change in the liver, nor in the kidney, although acute nephritis accompanied the disease. Further research on the function and structure of the normal liver was required. Dissociated functional derangement of the liver had been described by Brulé and his school, and investigation on those lines was needed. Dr. Rutherford, in reply, said that he had not met with the intense fatty infiltration described by Dr. Foulerton. He was interested in Professor Stewart's remarks on etiology, and in his note on the recovered cases. A bacteriological study of bowel contents would be useful, especially in cases where repeated attacks of jaundice had been noted.

CANCER RESEARCH TO-DAY.

In opening a discussion, on Thursday, July 1st, on the present position of cancer research, Dr. J. A. Murray touched on some of the difficulties besetting cancer research —difficulties which, owing to a want of comprehension, are regarded by the lay and even by the medical public with bored impatience. There is a universal conviction among laymen that, knowing how to spell the word, they know what cancer is. In reality clinical and microscopical data must be very carefully scrutinized before the malignant nature of a neoplasm can be established, and where a "cure" is claimed for any specific remedy the examination must, in the interests of future patients, be as stringent as possible. In animal experiments the proof required is successful transplantation of the tumour to normal animals. An important step in experimental cancer research was Jensen's discovery that resistance or immunity to grafted cancer could be produced in animals by an unsuccessful inoculation. Unfortunately spontaneous growths are not affected by this line of treatment. Much work has been expended on the subject, but the nature of the immune state is still unexplained. It only lasts a short time after inoculation, and is accompanied by failure of the fibroblastic and angioblastic reaction to implanted carcinoma, and also by the presence of plasma cells in the connective tissues throughout the body. Increase in the circulating lymphocytes, whether produced by x rays or exposure to a hot dry atmosphere, appears to prevent the development of implanted growths. The essential nature of cancer cells, said Dr. Murray, is still unknown to us, and our ignorance of the fundamental processes of cell life is the greatest difficulty in the way of cancer research. The cancer cell must somehow differ fundamentally from the tissue from which it springs, but as yet our biological and chemical investigations have failed to establish the nature of the difference. The method of culture of tissues outside the body which is being pursued at present may, when the technical difficulties are overcome, be productive of fruitful results. Dr. Campbell suggested, as a possible explanation of the etiology of cancer, that it was an attempt on the part of the organism to reproduce itself by budding. In lower forms parthenogenesis took place under certain conditions. In the human subject growth occurred at the sites where regressive changes were taking place. The ample blood supply stimulated growth and the cells tended to revert to a germinal type. If, in addition, there were chronic irritation and a hereditary predisposition, cancer was likely to supervene. Dr. Leitch spoke of the great service of inoculation experiments in clearing the ground and defining the extent of our knowledge. No one, however, could deduce a theory of cancer from them. There was often difficulty in distinguishing between innocent and malignant tumours. In animals the biological test could be performed, though it was not absolutely conclusive. Artificial resistance after unsuccessful inoculation was not a true biological immunity. There were no serological differences in normal or resistant mice. No serum reaction had yet been discovered in the human being which was of any value in the diagnosis of cancer. He hoped that biochemical research would reveal the difference between normal and cancerous cells. In his experience no cure had ever been effected by radium in cancer. Dr. Russ referred to his experiments on the effect of x rays on cancer in animals with a view of applying the results to x-ray therapy in man. A lymphocytosis was observed and lymphocytic activity occurred around grafts in immune animals. Nevertheless the circulating lymphocytes might be increased by x rays without producing immunity, so that some intermediate reaction was probably required. The degree of resistance to cancer implantation varied greatly in different animals, but all developed it to some extent. Dr. Mottram took a more hopeful view as to the possibility of producing immunization against cancer than Dr. Murray and Dr. Leitch. He remarked on the very different degrees of virulence exhibited by cancerous tumours. Predisposition in the individual was an important factor and appeared to be hereditary. Resistance to artificial growths might be increased in various ways, but our methods of protection were too feeble to have effect against spontaneous cancer. Dr. Simon Flexner spoke of Dr. Murphy's work at the Rockefeller

Institute, and insisted on the relation between lymphocytosis and the refractory period in animals. It was premature to think of cancer in terms of immunology, but it was conceivable that different states of immunity existed in different parts of the body. If this were true a tumour might regress in one situation and continue to grow in others. Professor Adami put forward the theory of cell growth originally enunciated by Ribbert. Experiments *in vitro* showed that cells might be induced to grow and multiply by appropriate stimulants. Such stimulation might be present in cancer and induce the cells to take on the habit of growth.

Bacteriology of Cerebro-spinal Meningitis.

On Friday, July 2nd, Dr. J. A. Arkwright opened a discussion on the bacteriology of cerebro-spinal meningitis. He said that among the many points of importance in the mass of work which had been done during the war the greatest interest centred round the classification of the meningococcus. This classification was made by morphological and cultural means and by agglutination. Workers were agreed that two main groups could be distinguished, but the relation of these groups to each other and the number and distinctness of the various subgroups were still a matter for discussion. Agglutination tests, though a satisfactory means of identification in the case of certain organisms—as, for instance, *B. typhosus*—were far from being so when applied to other groups. For this reason the method of "absorption of agglutinins" had been evolved, but it had the disadvantage that by its means a large and indefinite number of subgroups were separated, some containing strains that appeared to be closely allied on other grounds. Among these subgroups Gordon's Types III and IV had a special prominence, but whether this were due to the specially selected strains for the diagnostic serums or to greater definiteness of these two subgroups was not quite clear. The isolation of carriers in the present state of our knowledge was impracticable. As regards therapeutic serum its manufacture still needed much research and observation. The reference numbers on phials should be noted by medical men who administered it and the results reported to the manufacturer. In this way progress could be made. Dr. M. H. Gordon summarized the results which had been obtained at the Central Military Laboratory for the study of cerebro-spinal fever during the war. The pathogenic components of the meningococcus were investigated. Among the intracellular constituents were found a powerful reducing enzyme, a haemolytic substance, and the endotoxin peculiar to the organisms. The latter is a very stable substance, and plays the principal part in producing the lesions of cerebro-spinal fever. No extracellular toxins were detected. Four main serological types of the organism were isolated. Of these, Types I and II were present in 80 per cent. of the cases. No case and no carrier, as a rule, harboured more than one type of meningococcus. As regards treatment, the potency of any given serum depended on the amount of anti-endotoxin it contained. The application of serum rich in anti-endotoxin to a batch of clinical cases at once reduced the mortality. The efficient preparation and standardization of the serum was a matter of some difficulty, and investigations as to the best method of doing so were now being carried out. Dr. Hine analysed reports recording the results of treatment in cases of cerebro-spinal meningitis from all over the country. The mortality was definitely reduced in cases treated with serum containing anti-endotoxin specific for the type of organism in each case. Serum treatment must be instituted early and in adequate doses. A pooled serum could be used until the type of coccus was identified, when the suitable monovalent serum should be used. Dr. Ponder agreed with Dr. Arkwright as to the uselessness of isolating carriers, and thought that an official opinion should be expressed on this point. He had examined the bacteriology of the nasopharynx of non-contacts among the civil population. The meningococcus was found in 41 per cent., and of these 38 per cent. gave sugar and agglutination reactions, and 26 per cent. were positive to absorption tests. These results were higher than those obtained by other workers among contacts. He thought that the presence of the meningococcus in the nasal passages was comparable to that of the pneumococcus, and that it would be as reasonable to isolate pneumococcus carriers as it was to isolate persons harbouring the meningococcus. Dr. Gardner Robb agreed with Dr. Arkwright that polyvalent serums were of more general use than monovalent serums, and in his experience the results with polyvalent serums were equally good. Fallacies arose in statistics if factors such as age-periods and time when treatment is commenced were not taken into account. Making allowance for the higher death rate in infants, he found that at Belfast the civilian and military mortality were equal. Dr. Glover showed a series of charts illustrating the observations made on the carrier rate before and during epidemics. He showed that the numbers of carriers harbouring a virulent type of the meningococcus rose in proportion to the overcrowding. When the rate rose above 20 per cent. cases of cerebro-spinal meningitis began to occur. After overcrowding was stopped the carrier and case rate immediately fell. Dr. Ledingham said that in the East detention and isolation of contacts was impracticable, but good results were obtained by the avoidance of overcrowding and by general hygienic measures. The relation of pathogenic bacteria to their homologues needed study. He did not think that the use of monovalent serums was practicable. Dr. Carnegie Dickson discussed the paths by which meningococci reached the meninges. He attached importance to the fact that infection in the ventricles may be earlier and more extreme than on the meninges. Dr. Tulloch answered some of the criticisms made on the work of the central laboratories. He thought that too much stress had been laid on exceptions in discussing agglutination tests. The use of a standard technique was essential, both in culture and agglutination experiments. Dr. Gray said that in his experience the mortality in cerebro-spinal fever depended on the efficiency of the serum used. Early treatment was essential. The first three days of treatment really settled the issue and for this polyvalent serum must be used. He had had no success with monovalent serum when polyvalent serum had failed. Dr. Graham Forbes described a case of meningitis caused by *Diplococcus crassus* and gave an account of the characteristics of the organism. Dr. Scott agreed with Dr. Arkwright that there was no magic number of types. Under conditions of overcrowding the coccus passed rapidly from one individual to another and its virulence was thereby enhanced. Dr. Arkwright and Dr. Gordon replied.

SECTION OF PHYSIOLOGY AND PHARMACOLOGY.

Acidosis in Disease.

A discussion on acidosis in disease was opened on Wednesday morning by the President, Professor F. G. Hopkins, F.R.S. After reference to the need for a more precise nomenclature for distinguishing between the various types of condition in which the normal acid-base equilibrium of the body was disturbed, he pointed out that the physico-chemical composition of the blood was such that it constituted a coarse mechanism for the regulation of the reaction of the tissues, the fine adjustment being provided by the respiratory centre and the kidneys. Mention was then made of the alterations of acid-base equilibrium following on exposure to anoxaemic conditions, as investigated by Haldane and his co-workers, and the appropriateness of the term "alkalosis" was briefly discussed. The President's address was concluded by references to the still unsolved problem as to why the acetone bodies should appear in the organism whenever the carbohydrate metabolism was disturbed or arrested. Professor Bayliss, speaking second, thought that there was but little use for the word "acidosis" to express an actual increase in the hydrogen-ion concentration of the body fluids, as such a condition occurred but rarely; the effects of reduced alkali reserve were not necessarily due to hydrogen ions at all. Experiments were quoted which made it doubtful whether the plasma proteins played any part in the regulation of the reaction of the circulating fluid. Dr. H. H. Dale endorsed the President's plea for a precise definition and amplification of the nomenclature, and ascribed the unsatisfactory position of the questions under discussion to the lack of clearness on this point. Professor Milroy pointed out that owing to the fact that the products of disordered metabolism were strong acids they were serious competitors with carbonic acid for the

available bases of the blood and tissues. Dr. Poulton supported the view that proteins played a considerable part in the regulation of the acid-base equilibrium, and, having pointed out the need for caution in interpreting the results of determinations of the alkali reserve of the plasma by Van Slyke's method, concluded with reference to several pathological conditions in which the reaction of the blood had been studied in detail. Mr. Parsons briefly referred to the reaction-regulating mechanism of the normal blood. In the ensuing discussion Dr. Cammidge described experiments which suggested that the liver played an important part in the metabolism of the acetone bodies. The importance of the renal function in the regulation of the normal reaction of the blood was emphasized by Dr. Mackenzie Wallis; while Dr. Wilkins pointed out that a large proportion of cases of acute mental disease showed the presence of acetone bodies in the urine. Dr. Grace Sherwood observed that acetonuria was common also in children suffering from infective disorders. Interesting observations on post-operative acidosis were made by Mr. Cole, and Dr. Martin suggested that the toxins of acute bacterial diseases might produce disturbances of carbohydrate metabolism. Further discussion centred round the question of nomenclature and the function of the blood proteins in the regulation of the reaction of the circulating fluid. In his reply Professor Hopkins pointed out the value of careful records of cases in which ketosis occurred, for the elucidation of the problem presented by this fundamental error of metabolism.

DENERVATED MUSCLE.

On Thursday, July 1st, Professor J. N. Langley, Sc.D., F.R.S., opened the discussion on the physiology and treatment of denervated muscle with an account of observations he had made on the leg muscles of rabbits after experimental section of the sciatic nerve. His results, he said, gave no certain evidence that either massage or passive movements or regular electrical stimulation of the denervated muscles with currents sufficiently strong to produce powerful contractions had any appreciable effect in delaying the degeneration of the muscle itself. These observations had been confined to the first three weeks after nerve section, but later experiments by Hartman, Blatz, and Kilborn had shown that the same result was obtained if the treatment were continued for much longer periods. The beneficial effects of electrical treatment and massage in clinical practice might be due, to a great extent, to the accompanying general well-being and hopeful psychological condition of the patient. The commonly accepted theory that the degeneration of the denervated muscle was due to disuse was untenable, for otherwise electrically induced contractions should be able to prevent the degeneration. Dr. E. P. Cumberbatch said that the conclusion that the use of electricity was of little value in the treatment of paralysis was opposed to the experience of those who had had long experience with the method. He mentioned a case of infantile paralysis successfully treated by means of the sinusoidal alternating current, which does not produce active muscular contractions, but acts on the central ends of the severed neurones through sensory fibres from the skin. Dr. Cumberbatch added that an important factor in favouring the regeneration of nerve and muscle was the maintenance of a suitable temperature, for cold retarded the process. Dr. Turrell pointed out that electrical treatment of cases of nerve injury usually did not begin until at least three weeks after the wound, so that the clinical experience was derived from stages later than those observed by Professor Langley. Electrical treatment was clearly contraindicated as long as nerve irritation remained; this form of treatment was claimed to be of direct benefit after the establishment of complete nerve degeneration. Under some conditions the warmth produced by the passage of the current might in itself be helpful. Dr. Hernaman-Johnson emphasized the need for delaying the production of electrically-induced contractions until regeneration of the motor nerve was in part re-established. The faradic current was more adapted for this purpose than single condenser shocks. Dr. Adrian proposed that if the value of electricity as a curative agent was merely suggestive, it might be replaced by simpler and more effective deceptions. In cases where the current acted by stimulation of skin areas, similar effects might be produced by other forms of sensory stimulation. Electrical treatment was, however, directly beneficial when it caused contractions of the muscle fibres themselves, as it removed adhesions produced by hypertrophy of connective tissue and so kept the muscle in good mechanical condition. Dr. Burke was surprised that the electrical treatment of recently denervated muscles, as in Professor Langley's experiments, should not have done positive harm. Non-contracting currents should be used in the earlier stages, and only when voluntary power began to return should active contractions be induced. Dr. Roberts pointed out the harmful effects of stretching on denervated muscles, and ascribed the smallness of the beneficial effects observed in some cases to neglect of this factor. In concluding the discussion Professor Langley mentioned that the degenerative processes set up in the muscle were continuous, and did not undergo an abrupt change at the end of about three weeks or so. When connexion between nerve and muscle was re-established, then undoubtedly contraction benefited the muscle provided that the activity were not carried to the point of fatigue.

PHARMACOLOGY AND THERAPEUTICS OF QUININE.

A discussion on quinine and its related alkaloids in pharmacology and therapeutics was opened on Friday, July 2nd, by Professor W. E. Dixon, F.R.S. Having referred briefly to the chemistry of quinine, Professor Dixon proceeded to show the relationship between the mother substance itself and its newly studied derivatives. The pharmacological action of these substances, he explained, was not specific to any single tissue or group of tissues, but consisted of a general depression of metabolism. In producing this effect the quinine derivatives were in many cases more potent agents than the parent alkaloid. This was illustrated by their toxicity to protozoa and to bacteria, and by their paralysing influence on sensory nerve endings. Professor Ramsden gave an account of experiments showing that when quinine was added to the blood it existed in greater concentration in the plasma than in the corpuscles; he referred also to the capability of the kidney for secreting enormous quantities of quinine without showing any sign of damage. Major Acton summarized his experience in the treatment of malaria with cinchona alkaloids other than quinine; promising results had been obtained with both cinchonidine and quinidine. Sir Archibald Garrod regarded quinine as a contributing factor in the onset of blackwater fever in certain cases. Dr. F. S. Hele mentioned experiments showing that the rate of excretion of quinine in cases of blackwater fever was similar to that observed in the healthy subject. He made a comparison between the reaction of the organism to quinine and the protective synthesis and excretion observed in the case of other poisonous ring compounds. Lieut.-Colonel Sir Leonard Rogers gave an account of his researches on the administration of alkaloids, and recommended the intravenous injection of acid hydrobromide of quinine in severe and dangerous infections, and intramuscular injections of cinchonine in less severe cases. Dr. Nierenstein discussed the relation between quinine, haemoquinic acid, and blackwater fever. Dr. McWalter regarded quinine as useless as a prophylactic against malaria, and Dr. Wenyon pointed out the value of experiments on plasmodial infection in birds. Replying to Dr. McWalter, Sir Leonard Rogers quoted historical evidence that quinine prophylaxis was of real value. Professor Gunn referred to promising results he had obtained with two new alkaloids—harmaline and harmine—particularly in cases of relapsing malaria. Dr. Dale quoted an instance in which a course of emetine brought about a complete cure of dysentery in a human subject, but was without effect on the same strain of *Entamoeba histolytica* transferred to a kitten. The effect of a drug on a parasite was sometimes determined to a great extent by the host. Dr. Dale further pointed out the important possibility of using other cinchona alkaloids in place of quinine, and its relation to commercial policy concerning cinchona planting. Colonel McCarrison recommended the use of adrenalin for the prevention of a dangerous fall of blood pressure during injection of quinine. Dr. Bodman suggested that quinine injections might be more effective if accompanied by the administration of plain saline to increase the fluidity of the blood. Dr. Wenyon, also in reply to Dr. McWalter, spoke in favour

of quinine prophylaxis. In concluding the discussion Professor Dixon referred to the harmful effects of strong solutions of quinine salts on muscular tissue; the discussion had been useful and interesting, though it had left many of the points he had raised untouched.

NAVAL AND MILITARY SECTION.

THE ARMY MEDICAL SERVICE AND THE TRAINING OF THE NEWLY QUALIFIED.

A DISCUSSION on the Army Medical Service and its relation to the education and training of newly qualified medical men was held on Wednesday, June 30th, with Surgeon Rear Admiral A. Gascoigne Wildey, C.B., R.N., in the chair. Colonel Joseph Griffiths, C.M.G., the President, introduced the subject by pointing out the absence of organized education and training during the first few years of a professional career in civil life and the advantages of such training as that which took place in the Army Medical Service, where the young officer was taken in hand, trained, and educated in the special work of the Service, as well as in administration. He then pointed out that after a certain period many had to leave the Service, not because they could not do any more work, but because there was no room for them in the higher ranks. During the process of weeding the officer who was versed in special professional work and had not paid much attention to the administrative side was apt to be placed at a disadvantage; if possible, such a disadvantage should be removed even to a greater extent than it had been since the end of the war; officers still fit for work should be helped to posts under the State, or in some civil institutions—posts which they could fill with credit. Colonel Griffiths advocated an extension of the present scope of the Army Medical Service in order that it might train and educate more officers than it actually requires and provide from its establishment experienced men for service in other departments of State. By so doing the Service could pick the best men for retention in the Service. But no scheme could be a success unless facilities were given for leaving the Service earlier than at present. For a satisfactory outlet to the surplus personnel it was suggested that a liaison department would be necessary, and that once established would be found of great service in bringing the medical services of all the departments of State into closer touch with one another. Major-General Sir W. Macpherson stated that the adoption of such a scheme depended ultimately upon State finance. He personally would have welcomed such a scheme on his leaving the army. He thought it would prove equally advantageous to the officer and the State, and indeed it was now to some extent being put into practice. Colonel Johnstone thought the scheme an ideal one; he strongly recommended the Services to all medical men. Colonel Elliot said England was cursed by precedents, and the President's address broke away from such. He was strongly of opinion that the public medical services should not be the preserve of the army or any other service. He feared the scheme would tend to cut out the general practitioner from such appointments, and this he deprecated. He pointed out that as the R.A.M.C. had to deal mainly with healthy men their study was absolutely necessary. Dr. Buttar admitted that the scheme was ideal, but thought it should be discussed, and in addition he would advocate a wider liaison—possibly voluntary—between the services of the Crown and the members of the civil profession in order to avoid any possible friction and misunderstanding which under the present conditions were liable to arise. General Fell considered that complete collaboration between the Services and the civil side of the medical profession was essential to the success of any such scheme. Colonel MacMunn was of opinion that in the consideration of any new proposal efficiency in the army stood first. He pointed out that officers on the retired list within certain age limits remained liable to be called up for further service in case of national emergency. Colonel Lelean gave a most interesting account of the work done at the Royal Army Medical College during the war to combat the effects of poison gases used by the Germans. After receipt of the news of the first gas attack the work had to be put in hand without delay, and it was carried out with the utmost celerity in spite of many serious difficulties that necessarily arose in connexion with such a new problem. He graphically told the story of how officers and men gave themselves up to be experimented on so that the soldier might be protected at the fighting line whatever gas emanated from the German armies; our means became so effective that three weeks after the first gas attack the German gas offensive was truly countered and the enemy never regained the ascendancy from the advantage of being the first to make use of this dastardly method of warfare. After detailing the many and different experiments devised to sift the various suggestions put forward in order to render the gases sent over by the enemy into our lines ineffective, he gave in brief the very remarkable story of the evolution of the "helmet" which was ultimately perfected to such a degree that the "gas attacks" did but little harm to the fighting men although exposed in it from five to six hours consecutively. The President expressed the feelings of the meeting when, in proposing the thanks of all present, he said that this was one of the most remarkable incidents in the history of war. Major Helliwell read an instructive paper on the teeth in the recruit, in which he traced the gradual introduction of the dentist for the performance of a portion of the work of the Army Medical Service. He said that amongst British troops in India before the war 75 per cent. of men required dental treatment, the average of decayed teeth per man was 6, 3 or 4 of these being so far decayed as to necessitate extraction. During the latter part of the war it was interesting to note that of Class A 68 per cent., B 70 per cent., and C 78 per cent. suffered from decayed teeth. In the army, just as in civil life, decay in teeth was preventable by early attention and by the daily care of the teeth, and it was expected that as soon as the good effects of dental treatment amongst school children had been going on long enough pronounced improvement would be observed in the condition of the teeth in the recruits. The actual relation between sound dentures and physical health or disease had not yet been worked out, and not until statistics were available would any very reliable information be forthcoming. The President referred to decay in teeth as a most important factor in the cause of illness, not only in the soldier but also amongst the civilians, and expressed the hope that in the forces of the Crown a new development would take place to ensure that each sailor and soldier and airman possessed a sound and effective denture to give good mastication and effective buccal digestion. When the state of the health was as it should be, the soldiers would require but little if any active dental treatment, and with the improvement in physique after entrance to the army it was not likely that dental disease to any material extent would arise.

DEMONSTRATIONS AND EXHIBITS.

During the afternoon a large and varied exhibit was on view. Colonel Lelean displayed a remarkable collection of miniature models of all the means adopted in effective sanitation in the field, all being designed to maintain the health of the troops and to prevent the occurrence of disease. As a teaching collection it was unique, and doubtless of the greatest value to obtain practical knowledge. Major Rigby was in charge of the *x*-ray exhibit, which had the day before been rapidly put together and placed in working order. Major Sinclair, who was demonstrating his method of dealing with fractures elsewhere, exhibited a selection of the varied collection of splints and apparatus such as were available in the Army Medical Service. Colonel Martin Flack, Royal Air Force, had a most interesting exhibition of the newest test methods for the detection of physical defects in candidates presenting themselves for the Air Service. Especially interesting was the vision test for measuring the accuracy of the judgement in estimating the niceties of distance such as were necessary when landing in an aeroplane.

SECTION OF OBSTETRICS AND GYNAECOLOGY.

PUERPERAL SEPSIS.

IN opening the session on Wednesday morning, June 30th, Dr. Herbert Williamson, the President, pointed out the very great importance to the State as well as to the individual of the subject chosen for discussion—namely, puerperal sepsis. Obstetrics, he said, was essentially a branch of preventive medicine, and the State was now

awakening to the fact that in the past it had neglected the safety and welfare of the mothers of the nation. From the experience of war surgery a far clearer conception had emerged of the principles of wound infection, and this knowledge could now be used in the treatment of a septic muscle like the uterus. Mr. Victor Bonney, in his opening paper, stated that in nearly all cases of severe puerperal sepsis the streptococcus, either alone or in conjunction with *Bacillus coli communis*, was the predominant organism. He was strongly of opinion that the original source of the organism in the majority of cases was autogenous and not heterogenous, the zone of skin with the anus as a centre being the breeding ground of the organisms. He advocated the practical sterilization and shutting off of this part during labour. The next question he asked was how the organisms get into the uterus. The most obvious means was by the hands and instruments of the attendant, but at the same time Mr. Bond's experiments proved the possibility of inanimate particles passing in the reverse direction of the main stream up into the uterus, and into the peritoneal cavity. He pointed out that the ovarian plexus of veins draining from the placental site was the commonest and most important route of infection, the phlebitis being accompanied by lymphangitis. In speaking of treatment he reviewed all the recent methods, and came to the conclusion that at present there was no surety of defeating the causative organisms by surgery or by direct application of antiseptics. He thought, however, that the resistance of the body could be raised by vaccines, and an attempt could be made to prevent organisms and their toxins reaching the general circulation by means of ligaturing or excising the ovarian plexus of veins and lymphatics, which he had done with success on several occasions. Mr. Beckwith Whitehouse advocated the treatment of the infected uterus by the Carrel-Dakin method of irrigation. In carrying out this method it was better to curette the uterus first, but owing to the dangers and difficulty of the operation it could only be a treatment for the hands of experts under institutional conditions. He also considered intravenous medication by flavine in normal saline a beneficial treatment. Dr. A. E. Gow advocated protein therapy in addition to sensitized vaccines. He then gave in detail the technique. In regard to autogenous vaccines he suggested that the causal organism could generally be isolated more quickly from an intrauterine swab than from the blood cultures. Dr. Leith Murray, in a paper dealing with serums and vaccines, mentioned the importance of early treatment and the necessity of taking blood cultures during the acute stage, preferably during a rigor. In the interval, during the preparation of vaccines, he advised large quantities—for example, 50 c.cm. of antistreptococcal serum. He spoke highly of autogenous vaccines, and in his concluding remarks advised treatment by an obstetrical officer rather than by the public health authorities. Dr. Lewis Graham gave his experience in the treatment of 800 cases of puerperal sepsis admitted after notification to the public health authorities to a maternity hospital in Birmingham. He considered general treatment of primary importance; injury to the uterus during treatment or curetting was definitely harmful. He, too, strongly advocated treatment in women's hospitals and not ordinary fever hospitals. Dr. Eardley Holland dealt chiefly with the question of prevention, and rejoiced that Mr. Bonney had brought forward the question of autogenous injection. He advocated very strongly rectal examination, and stated that during ten years he had never done a vaginal examination in normal cases of labour. Dr. Amand Routh had not been converted to the view of autogenous infection. Most cases of infection could be prevented by douching the uterine cavity, in suspect cases, with strong iodine solution, which he also advocated in various strengths if there was subsequent fever. As a general treatment he considered liquor ferri perchlor. of great use. Dr. Ivens advocated preparation as for operation, in every case of normal labour, and as treatment the early injection of polyvalent serums, which she had found beneficial during her experience of war surgery. Dr. Hedley did not think it justifiable to teach the theory of autogenous infection. Treatment, he considered, should be on general lines, but he did not advise curettage; he was optimistic about the Carrel-Dakin method. Dr. Lapthorn Smith advocated the sitting up of a patient as a help to drainage, and the abolition of all bed-pans. Dr. R. C. Buist insisted that there were two problems: preventive and therapeutic, and two things must be remembered: first, that there was a natural history of puerperal sepsis with a natural response by the patient to the attack; secondly, a very long series of cases was needed in order to get rid of the element of chance under any particular method of treatment. Dr. R. W. Johnstone said that before any rational system of prophylaxis or of treatment could be adopted a clear conception of the pathology of puerperal sepsis must be in the mind of the clinician. He thought too much emphasis had been laid on the condition of the uterus. In the majority of cases the lower part of vagina, perineum, cervix, and lymphatics of broad ligaments showed clinical signs of inflammation, whilst the body of uterus was relatively free. He agreed with the autogenous derivation of this inflammation, and as an antiseptic for the perineum he preferred a saturated solution of picric acid in alcohol. Where sepsis was established his attitude was not so much pessimistic as timorous, and he felt that any surgical procedure was fraught with danger to a patient whose powers of resistance to organisms was already low. He relied mainly on promotion of drainage by posture, douches, etc., and on keeping up the general strength by good nursing. Dr. Deighton agreed with some of the former speakers that prevention by means of strict aseptic precautions, as for an operation, was the solution of the problem. Dr. R. J. Rowlette relied on vaccines for treatment of this condition, with serums as a help. He suggested that small doses of stock vaccines should be given whilst an autogenous vaccine was being prepared. Dr. F. Edge considered that the organisms were autogenous and in most cases conveyed to the interior of the uterus by the hand or instruments of the attendant. He advocated thorough examination under anaesthetic in every case and natural drainage by posture. Dr. Parry said that it was the duty of the teachers of obstetrics to emphasize the necessity of shaving the vulva and taking other aseptic precautions. He protested against the teaching of an autogenous mode of infection, as leading to carelessness in the conduct of labour. Dr. Pechère said that the mortality in all districts of Belgium from puerperal sepsis was remarkably low. He described the Belgian method of treatment as an early intravenous injection of protein, combined with a stock polyvalent streptococcal vaccine, whilst an autogenous vaccine was being prepared. The President then lucidly summed up the lessons brought out by the discussion. In the afternoon a demonstration was given by Dr. Mackenzie Wallis on the "Diastase activity in pregnancy toxaemia."

SECTION OF TROPICAL MEDICINE.

PROFESSOR G. H. F. NUTTALL, the president of the section, opened the proceedings on Wednesday, June 20th. He expressed his pleasure in seeing so many present and regretted the absence of Sir Patrick Manson. Professors Stephens and Yorke were called upon to read a paper entitled the problem of filariasis. This valuable contribution showed that the published figures from various regions brought out a marked discrepancy between the incidence of microfilaria in the blood and the sequelae of that disease. Further researches were obviously necessary. Drs. Low and Manson-Bahr followed with a paper entitled the rôle of *F. bancrofti* in the production of lymphatic obstruction and a consideration of elephantiasis from the pathological standpoint. Both these papers were debated together, and Major Black, Surgeon Captain Bassett-Smith, Dr. Anderson, Surgeon-General Hehir, Drs. Law and Spearman took part in the discussion. Dr. Manson-Bahr then read a paper on recent experiences in the treatment of kala-azar and trypanosomiasis by injection of acetyl-P-aminophenyl stibiate of sodium. He pointed out that he had received encouraging results in the treatment of these diseases with large doses of the inorganic compound of antimony, and issued a plea for its more extended use on an experimental basis. Professor Nuttall, Drs. Wenyon, Low, Anderson, and Balfour, Colonels Cummins and Kennedy took part in the discussion. Lieut.-Colonel R. McCarrison, I.M.S., then read a most interesting paper on dietetic deficiency and endocrine activity, with special reference to deficiency oedemas. This paper gave the results of various diets in the suprarenals, and was discussed by Drs. Anderson, Waugh Scott, Low, and Manson-Bahr, Surgeon-General Hehir, and Surgeon Captain Bassett-Smith.

In the afternoon practical demonstrations with beautiful specimens were given by Professor Leiper on parasitic worms, Professor Newstead on tsetse flies, Dr. Manson-Bahr on lymphatic obstruction by *F. bancrofti*, and Sir Leonard Rogers on the treatment of leprosy. Dr. W. Hunter gave an illustrated lecture on Serbia under typhus in 1915, which was much appreciated. In the quadrangle Colonel S. P. James demonstrated the use of the mobile malaria laboratory used by the Ministry of Health. This laboratory is of special service in travelling from village to village seeking out endemic foci of infection and taking immediate measures to prevent spread from carriers which are found. Since August, 1917, 426 cases of locally contracted malaria have been discovered in England. Colonel James also demonstrated a new method of staining mosquitos in order to investigate flight problems.

DEMONSTRATIONS.

Value of Antimony Tartrate in Bilharzia Disease.

On Thursday, July 1st, Dr. J. B. Christopherson, C.B.E., gave a demonstration on the value of antimony in the treatment of bilharziosis. He prefaced his remarks by saying that the schools, hospitals and houses of Egypt were full of bilharzia disease, which more than anything else was accountable for the indolence of spirit, want of character, and the backward condition of development of the Egyptian fellah; as the fellaheen formed 90 per cent. of the population the same might be said of the Egyptian nation. The treatment of bilharzia disease by the intravenous injection of antimony tartrate had abundantly established itself. About 160 cases had already been reported by various writers. Dr. Christopherson emphasized two points: (1) That antimony tartrate kills the adult bilharzia worms and the ova also; they were fixed and stopped where deposited, and hence disappeared from the urine. (2) That the method was capable of wide application, for it could be used for out-patients; to illustrate the latter point, he injected a patient at the demonstration who came from London and returned home to London by the ordinary means of transport on that day. The man was given 2½ grains of antimony potassium tartrate, and had received altogether 20 grains in ten injections in 20 days. Dr. Christopherson said that now that a cure for the disease had been found it behoved the Egyptian Government to apply it nationally. The intravenous injection of antimony should be carried out in a scientific manner by men accustomed to work with care and to be guided by the results of their work. If carried out through the agency of mobile laboratories, in co-ordination with the prophylactic measures suggested by Leiper for the destruction of the intermediate hosts—the molluscs—the plan would probably result in the annihilation of the disease in a few years. It was not possible for English doctors to undertake the work at the present time, as the motive might be misconstrued by the fellaheen in their present condition of unrest, but there were now many Egyptian doctors who by their character and their training at the Kasr-el-Aini Hospital, Cairo, and subsequently in England, were qualified to undertake this important work. It would be a proper and a graceful act of appreciation by the Egyptian Government if it enabled them to carry out the great work of ridding their country of what Professor Madden rightly termed "Egypt's most dangerous modern plague."

Afterwards Dr. J. F. Gaskell demonstrated interesting specimens of malignant tertian malaria from Salonica, and Lieut.-Colonel F. H. Stewart, I.M.S., gave an instructive and highly original demonstration illustrating the life-history of *Ascaris lumbricoides*.

SECTION OF MEDICAL EDUCATION.

PRELIMINARY SCIENCE IN THE CURRICULUM.

SIR GEORGE NEWMAN, in opening the proceedings on Thursday, July 1st, remarked that Cambridge of all the medical schools was the one most intimately and historically connected with the subject they had to discuss. The Section was fortunate in its time as well as in its place of meeting, for not only was the very admirable Edinburgh Report before them, but the General Medical Council had decided only a few days previously to have the whole question of the curriculum dealt with fully and forthwith. Sir George Newman proceeded to read the introductory address on the place of preliminary science in the medical curriculum, which appeared in the BRITISH MEDICAL JOURNAL, July 3rd, p. 8; then followed the opening papers, also printed in that number, with special reference to chemistry, physics, biology, anatomy, and pathology, by Professors Arthur Smithells, Sir Ernest Rutherford, Sydney J. Hickson, Arthur Keith, and Lorrain Smith respectively. Dr. Simon Flexner (New York) pointed out certain respects in which research work was peculiarly stimulating to the student, and also urged that there should be no standardization of medical education—only a minimum of conformity, sufficient to provide for qualification. Professor Giacosa (Turin) suggested the promotion of an international agreement in order that a common standard of medical practice in all civilized nations might be attained. Each country ought to conserve its own traditions and curriculums, but the latter should be so arranged as to bring about the same results in different countries. Sir George Newman said that Dr. Giacosa's suggestion practically meant a free republic of medicine all over the world. The great difficulty, of course, was the varying standards of medical education and training in different schools and countries. Following upon these two speakers from abroad came a large number of teachers to take part in the discussion, so that the later speakers had to compress their remarks within three minutes. Dr. J. C. McWalter (Dublin) urged the raising of the standard of the preliminary examination. Dr. R. C. Buist (Dundee) pointed out certain limitations of the specialist teacher, and also said that the essential reform of medical education should begin in the elementary school. Professor H. S. Raper felt strongly that there was something in the presentation of the subjects of chemistry and physics at the university that could not be given in the school, partly owing to the immaturity of the lad at school and partly to the freedom of the university atmosphere. Professor Ritchie (Edinburgh) also emphasized the essential distinction between the school attitude and the university attitude towards knowledge—the one receptive and dependent, the other original and independent. Dr. A. G. Tansley dealt with the teaching of elementary biology to medical students, and Professor F. O. Bower urged that sciences of comparison and opinion such as zoology and botany were beyond the boy of 16, and did not come properly in the school period, though sciences of exact statement and measurement, like physics and chemistry, did. Dr. H. B. Brackenbury deprecated the idea which seemed to run through some of the speeches that general practitioners belonged to an inferior race of medical men. The general practitioner needed to be at least as good a scientific man as the specialist or the professor. The remaining speakers were Professor J. A. Lindsay, Professor Wardrop Griffith, Dr. Carey Coombs, and Professor Boycott. Certain motions were handed up to the President, but were not put formally to the Section. The members present, however, concurred in the President's suggestion that he should transmit them, along with the text of the discussion, to the University Grants Committee and to the Education Committee of the General Medical Council. They were as follows:

1. That the lowest age of registration for the medical student should be 17 years.
2. That in the forthcoming revision of curriculum promised by the General Medical Council the lightening of professional studies would be facilitated if chemistry and physics were made school subjects, biology remaining a professional subject.
3. That with a view to securing adequate training in physics, chemistry, and biology as applied to medicine by courses of these subjects within the professional curriculum, it is desirable to exact a knowledge of physics and chemistry of matriculation standard of all medical students before they are registered.

SECTION OF VENEREAL DISEASES.

VENEREAL DISEASE IN WOMEN AND CHILDREN.

THE Section of Venereal Diseases met on Thursday, July 1st, with Mr. E. B. Turner, F.R.C.S., president, in the chair. The Section is a new one, and whatever doubts the organizers may have felt before the meeting, these must have been dispelled when they saw how large was the audience that had assembled to listen to the opening papers and how keen the interest taken in the subsequent

discussion. The subject under consideration was venereal disease in women and children. Dr. Morna Rawlins introduced the subject of venereal disease in women, and Dr. Leonard Findlay that of venereal disease in children, an interval for discussion being allowed between the two papers. Amongst other points debated was the question of compulsory notification. Dr. Leonard Findlay, after laying stress on the appalling waste of child life for which syphilis was directly responsible, put forward a plea for the notification of all cases of stillbirth and miscarriage. These cases could then be carefully investigated, and, if due to syphilis, prophylactic measures adopted. Ophthalmia neonatorum was already a notifiable disease, and in Dr. Findlay's opinion the difficulties usually considered to be associated with notification were by no means insuperable. Other speakers subsequently spoke for and against compulsory notification, the trend of feeling being generally in favour of a measure of this description. The question of treatment was equally well debated. It was generally agreed that the modern treatment of syphilis was extremely satisfactory, but that the treatment of gonorrhoea, especially in the female, was still in its experimental stage. The problem was a problem of drainage, but the complexity of the cavity to to be drained rendered it an extremely difficult one. The key to the difficulty might very well lie in raising the antigenic index of the blood, but in the meantime vaccines had only met with very limited success in this direction. Amongst others who took part in the discussion were Dr. Amand Routh, Sir James Galloway, Colonel L. W. Harrison, Dr. Sellers, Dr. Marian Mackenzie, Professor Pechère (Brussels), Dr. Masterman, Dr. Butcher, and Mr. Kenneth Walker.

In the afternoon various demonstrations were given. Dr. Barnard (President of the Microscopical Society) gave an excellent demonstration of the dark-ground illumination work in the detection of *Spirochaeta pallida*. Colonel Harrison discussed the question of the treatment of gonorrhoea in the male, and Dr. Morna Rawlins gave a demonstration of instruments and methods used in the treatment of the same disease in the female. All the demonstrations were well attended.

SECTION OF ELECTRO-THERAPEUTICS.

PARALYSIS DUE TO NERVE INJURY.

THE proceedings in this Section on Friday, July 2nd, were opened by some introductory remarks from the President, Dr. A. E. Barclay, who referred to the recent establishment of a diploma in medical radiology and electrology by the University of Cambridge. In the new era opened up by the granting of this diploma every appointment would be held by men and women who had had greater advantages than those to whom he was speaking, and a higher standard than had been possible in the past would be expected and demanded of them. The chief discussion of the morning was on the diagnosis and treatment of paralysis caused by nerve injury. It was opened by Mr. H. S. Souttar, C.B.E., whose attention had been addressed to this subject as a result of his experiences in the large Physical Treatment Department at the British Red Cross Hospital, Netley. He reviewed the various electrical modalities from the point of view of this special treatment, not confining himself to the currents which were capable of producing contractions in paralysed muscles, but also touching on the currents which had not that power and yet might be beneficial indirectly. In his opinion the faradic current had its place in the treatment of a paralysed limb, both by exercising the normal muscles and by a stimulating action on the circulation. In the subsequent discussion, Dr. James Turrell thought that the opener had not paid sufficient attention to electrical methods for diagnosis. Dr. Hernaman-Johnson could not agree that it was desirable to make a muscle contract *en masse* until some degree of regeneration had occurred. Once any nerve-ends had reached the muscle, however, cautious stimulation of the muscle as a whole became of the utmost value. Dr. Noel Burke spoke on the value of the electrical testing of nerves at operation; he had been able to test rather carefully the electrical conditions in a series of about 80 cases during the earlier days of the war, and he drew certain general conclusions. Dr. Worster-Drought dwelt upon the value of testing by means of condensers, and gave his experiences of 2,000 cases of injury to the nerves of the upper and lower limbs which he had seen while acting as a military radiologist. Dr. Howard Humphris put in a word for the static wave current, which, he thought, ought not to be omitted from a discussion on the subject of paralysed muscles. Mr. Souttar, in reply, said that at operation it was his custom repeatedly to test the nerve he was exploring, and he could not lay too great stress upon the value of the results obtained. A paper by Dr. Robert Knox on radiography of tumours of the chest was then read, in Dr. Knox's absence through illness, by Dr. Shillington Scales. This was a comprehensive paper, in which the author dealt in detail with the tumours most frequently found in the thorax, and then passed on to a more technical description of the *x*-ray appearances and the differential diagnosis. Dr. Ironside Bruce, Dr. Hope Fowler, Dr. Florence Stoney, and others discussed the paper. Dr. Gilbert Scott read a paper on the diagnostic value of the renal outlines, first of all in the case of the normal kidney, then in the case of kidneys abnormal in size, and finally in cases in which there were abnormal shadows, and he indicated a method of determining the relation of such shadows to the kidney itself. Before the Section closed its proceedings, two papers were read on therapeutics. One of them was by Dr. Goodwin Tomkinson, of Glasgow, who brought forward some interesting notes of cases in which *x* rays had been applied to the treatment of "Oriental sore." His conclusion was that there was something to be said in favour of this treatment, especially where the patient objected to intravenous injection involved in treatment by antimony tartrate, or to the pain and discomfort attendant upon treatment with solid carbon dioxide. The other paper was by Dr. Howard Humphris, who described the use of the melted paraffin wax bath, and indicated its employment in stiffness of muscles and joints due to certain causes, and also in other conditions, such as chilblains or neuritis.

SECTION OF MEDICAL SOCIOLOGY.

THE FUTURE OF MEDICAL PRACTICE.

THE Section of Medical Sociology met on Friday, July 2nd, with Dr. George E. Haslip, president, in the chair, and devoted its single session to a discussion on the future of medical practice. The opening papers by Sir George Newman, Sir Wilmot Herringham, Dr. Alfred Linnell, Professor Gowland Hopkins, and Mr. E. W. Morris, C.B.E., which are printed in this number, were then read by their authors. Sir George Newman, before reading his paper, said he wished to make it clear that his paper was written before the publication of the Report of the English Consultative Council. Even had it been written subsequently he would have been debarred, as a State servant, from making any comments, since any advice he could tender on the subject must first be given along other channels. But he trusted that no one would interpret the absence of reference to Lord Dawson's report as being discourteous or negligent on his part.

THE PATHOLOGICAL SOCIETY MEETINGS.

THE Section of Pathology and Bacteriology devoted its afternoons to taking part in the proceedings of the Pathological Society of Great Britain and Ireland, which met each day at 2.30 in the Pathological Department, to hold discussions and witness demonstrations. Dr. Shearer showed the calorimetric method of heat estimation during the growth of bacteria, and Gamgee's method of recording, photographically, changes of body temperature. Dr. Constant W. Ponder showed photographic records of acid formation due to growth of *Bacillus coli communis*; Dr. Strangeways, cell division in cultures of animal tissue *in vitro*; Dr. Louis Cobbett, tuberculous lesions in animals; Sir G. Sims Woodhead, the interaction of hypochlorous acid and organic matter; and Dr. W. H. Harvey demonstrated three technical methods. Cinematograph demonstrations were arranged by Professors Woodhead and Dixon. The wards, museum, and laboratory of the Cambridge Research Hospital, in Hills Road, were on view during the meeting, and the director, Dr. Strangeways, demonstrated cases of chronic arthritis.

British Medical Journal.

SATURDAY, JULY 10TH, 1920.

THE CAMBRIDGE MEETING.

THE extraordinary success of the meeting of the British Medical Association at Cambridge last week was due to the keenness and to the spirit of good fellowship with which both those who prepared for it and those who took part in it were imbued. There has been so much random talk about reconstruction that the term has been rather blown upon as though it were a mere political catchword. No one who followed the work of the meeting at Cambridge could doubt that it had a real meaning for the medical profession, which is ready to meet new conditions with courage and foresight. Foresight in the two respects needed: the scientific and clinical on the one hand, and on the other the social, including so much of politics as may be necessary to ensure that medical opinion shall have its proper weight with the legislature and the Government.

Of the spirit and purpose which we have ventured to say were characteristic of the meeting the President was the exemplar and in no small measure the cause; he seemed ubiquitous, his interest in all that happened was a continual inspiration. He was indefatigable also, and on Friday evening, when he was thanking his helpers in Cambridge, he could speak with the same freshness and grace as when he delivered his Presidential Address four days earlier. It is evidence of the commanding position Sir Clifford Allbutt has attained as a representative of medicine in public life that the King has graciously taken this occasion to direct that Sir Clifford Allbutt shall be sworn a member of the Privy Council.

That the work of the Sections should have been of an order to merit his praise is their highest commendation and his best reward. We publish elsewhere a running account of the proceedings, which will afford some indication of the interesting character of the scientific and clinical discussions. Special arrangements have been made to publish at an early date full reports of all. On each of the three days on which the Sections met there were demonstrations in the afternoon, beginning at 2.30. So much of medicine, surgery, and pathology is objective that the opportunity of seeing experts at their own jobs was highly appreciated. We heard nothing but approval of the plan, which followed the precedent set at the Special Meeting in London in April, 1919. The extensive buildings of the Cambridge medical schools, all occupying adjacent sites, made it easy for the large number of members who wished to witness the demonstrations to visit several each afternoon; and at 4.30, when they came to an end, the relaxation of a visit to some place of interest in the neighbourhood of Cambridge had been well earned by a day's work full of interest and variety.

The Representative Body of the Association, under the urbane chairmanship of Dr. Garstang, transacted a great volume of medico-political business during the four full days set apart for its deliberations. The report of the first three days' proceedings appeared in last week's SUPPLEMENT, and the fourth day is reported in the same detail this week. Several burning topics were debated at great length, and it is much to the credit of the Representative Body as a whole, and of its chairman in particular, that the programme of its annual meeting was carried through to the end within the appointed time, that rancour and ill feeling were absent from the discussions, and that decisions were taken on all important questions. We may be allowed to congratulate Dr. Garstang on the success that attended his courteous and considerate handling of the reins throughout the four days' arduous journey.

On the social side the eighty-eighth Annual Meeting of the Association will stand out in the memory of all who took part in it. True to their traditions, the University and Colleges, the municipality, the medical profession of Cambridge and district, and many residents not connected in any way with medicine, all combined to dispense delightful hospitality. The corps of willing workers, who for months past had laboured to perfect the local arrangements, must now feel that it was well worth while. Where so many spent themselves royally in the entertainment of their guests it seems invidious to apportion praise, but a few outstanding names must be mentioned. Dr. J. F. Gaskell and Dr. G. S. Haynes, the Secretaries of the General and Executive Committees, were the two pillars on which the whole fabric of the meeting rested. Prominent among their fellow workers were Professor W. E. Dixon, Chairman, and Mr. Arthur Cooke, Secretary, of the Demonstrations Committee; Dr. W. W. Wingate, Chairman of the Local Entertainments Committee; Dr. L. E. Shore, Chairman of the Hotel and Lodgings Committee; Colonel Apthorpe Webb, Chairman of the Dinner and Luncheon Committee; Dr. O. Inchley, Secretary of the Excursions Committee; and Dr. W. R. Grove, President of the Cambridge and Huntingdon Branch, which in 1914 had invited the Association to meet in Cambridge in 1915 and has been able only this year to carry out its intention. In thanking these and many other officers, as well as the indefatigable members of the several Ladies' Committees and Subcommittees, for all they did to make the meeting a triumphant success, we know we express the feeling of every member of the Association who visited Cambridge last week. Grateful reference must also be made to the hospitality shown by Alderman W. L. Huddleston, D.L., at Sawston Hall; by the Bishop, Dean, and Canons at Ely Cathedral; by Sir Douglas Newton at Croxton Park, by the Earl of Sandwich at Hinchingbrooke, and by Colonel T. W. Harding at Madingley Hall. In another column we give short notes on the receptions and other entertainments provided so lavishly in Cambridge by various individuals and bodies. To Dr. Peter Giles, Vice-Chancellor of the University and Master of Emmanuel College, and to the Mayor of Cambridge, the Association owes a great debt for personal hospitality and hearty support in many directions. The last day of the meeting was brought to a fitting close with a reception given by the Master and Fellows of Trinity in the lovely grounds and buildings of their great foundation.

We will end this too brief acknowledgement by placing on record the thanks of the British Medical Association to the Master and Fellows of St. John's for entertaining more than 200 members of the Association at dinner in the College Hall. This Hall, with its hammer-beam roof and oak-panelled walls, and the Combination Room adjoining, have been aptly described by Dr. F. J. Allen in our columns as the finest mediaeval interiors in Cambridge. The speeches made after this memorable dinner are reported in the SUPPLEMENT at page 30.

PROFESSIONAL SECRECY.

THE principle that the information obtained by a doctor in the course of medical practice should be regarded as secret dates from ancient times; it has always been regarded by the medical profession as of a most binding character and the bedrock of the relations between patient and doctor. This rule has not been imposed by law upon the profession, but was set forth by the profession for its own guidance; it is the natural outcome of the essential nature of the relationship. The doctor finds it necessary to seek the confidence of the patient in matters of a very intimate kind if he is to be in a position to give the best advice, and the reciprocal duty of not disclosing the information so received immediately follows. In order that all may know the condition on which such confidences are received and given the medical profession binds all its members to secrecy. So generally recognized has the validity of this rule become that for breaches of it damages have been awarded by the courts to those aggrieved thereby. In cases, however, in which the State has found that the interests it protects come in conflict with the principle of professional secrecy it has insisted that the public interest should prevail and override the claim that the information obtained by the doctor is confidential.

The profession has recognized the validity of this claim in general so far that when requested to give information of a confidential nature in a court of law the custom is for the medical practitioner to point out to the court the confidential nature of the information required and to ask for the ruling of the court. If the court orders him to give the information, he is regarded as in general absolved from the duty of secrecy. This applies not only to the High Court but to a coroner's court or a bench of magistrates. It sometimes happens, however, that even when ordered by the court to divulge the information in his possession, the doctor feels that he would not be justified in so doing, and refuses. In such a case he may be committed for contempt of court, and he must be prepared to face the consequences of his action; but the court would take into consideration the grounds on which he had taken up such a position, and in certain cases the court has not taken any action against the doctor. Similarly an exception to the rule of secrecy has been made where information obtained in the course of professional duties has to be given under the provisions of an Act of Parliament, as in the notification of certain diseases and of births. At first the profession was disposed to resist the introduction of this principle, but it has come to recognize the justification for it in the interests of public health, and loyally carries out the law. The public furthermore has recognized that the objections to such measures on private grounds are outweighed by the general advantage in which every one from time to time shares, and has accordingly acquiesced in and approved of such measures as have been adopted hitherto.

We have thus two well-defined classes of case in which the medical profession has in practice recognized the necessity for departing from its strict rule at the demand of the public good. There are, however, other cases less well defined in which the doctor's duty as a citizen may override his professional obligations, as, for example, when the disclosure of information obtained in the exercise of his profession may be necessary to prevent the commission of a crime, or to prevent grave danger to another person, or to safeguard the interests of the patient himself, as happens, for instance, in dealing with persons suffering from mental disorder. In these cases it is extremely difficult to find a form of words to define the exact conditions which will justify departure from the rule; it must be left to the individual doctor to decide whether there is such compelling force in his duty as a citizen as to make him break his confidence, and he must be prepared to justify such departure from rule by showing that no other measure would suffice to prevent a grave evil. Among other precautions, he would be expected to take counsel with another medical practitioner and to bring the strongest possible influence to bear upon the patient to induce him to consent to the disclosure. This course will often prove successful, especially when the reasons in support of such a course are fully and forcibly put before the patient; but when every other method has failed the doctor may in such cases feel bound to divulge the information in his possession, and his action in such circumstances would not be condemned by his professional brethren.

The question has been brought to the front recently by the problem arising out of the prevention of venereal diseases. It so happens that recently, for the first time, the principle of professional secrecy has received official sanction by its adoption in the regulations under the Act dealing with venereal diseases. On the other hand, there has recently arisen in some quarters a demand for legislation making compulsory the notification of venereal disease. At present public opinion seems to be hostile to such a proposal, and perhaps wisely so, because it is perceived that such a measure would tend to defeat its own ends, and to wither the growing tendency to seek advice and treatment in the early stages of the disease. In such a matter until public opinion is ripe for the change it would be short-sighted policy to introduce a law of this kind, and that is the attitude towards the proposal that has been taken up by the National Council for Combating Venereal Diseases. The question remains: Is there in the problem of the prevention of venereal disease any ground for relaxing the rule of professional secrecy which has prevailed hitherto? We have seen that the foundation stone on which the whole structure of the relations between patient and doctor has been built, and to which we largely owe our present power of dealing effectively with the evil, is the confidence of the public built upon this rule of secrecy. It is admitted that exceptions have to be made in the public interest and have been made in the past, but it is so difficult to define these exceptions in terms which would not open the door to a too great laxity of interpretation, that at the recent Representative Meeting it was thought best for the profession to maintain the rule in the form that the medical practitioner should not, without the patient's consent, voluntarily disclose information which he has obtained from such patient in the exercise of his professional duties. It is clear that the word "voluntarily" exonerates him if he discloses information under the compulsion of a court of law or at the behest of an Act of Parliament. It does not clearly exonerate him in the other cases, and the onus of justification is thrown on him. The guiding principles must be the gravity and extreme probability of the impending evil to another person and the impossibility of preventing it by any less drastic step.

The wording of the rule in the past has been slightly more stringent than this, but even so it has served as a good guide, and no doctor would be harshly judged who, knowing professionally that a man deliberately intended to marry when liable to convey the infection of syphilis—with imminent risk to the woman and her possible children—should, after exhausting every

other means of preventing such a thing, find himself driven to take the step of disclosing the danger to those who could prevent it happening. Just as a doctor must sometimes defy authority urging him to disclose his knowledge, so in certain very special cases he may be justified in departing from the rule of the profession binding him to secrecy; but in either case he must make sure that he can justify his course of action in the particular circumstances of the case.

ANNUAL MEETING NOTES.

HONORARY DEGREES.

THE honorary degree of Doctor of Laws was conferred by the University of Cambridge, at a congregation in the Senate House on June 29th, upon the following distinguished members of the profession attending the meeting of the British Medical Association. The recipients were presented by the deputy Public Orator (the Rev. C. E. Raven, B.D., Dean of Emmanuel College) in the following Latin speeches, to which we have ventured to append translations.

SIR THOMAS CLIFFORD ALLBUTT, K.C.B., M.D.,
Regius Professor of Physic in the University of Cambridge; President of the British Medical Association.

Multis abhinc annis studiis medicis apud nos praefectum, gaudemus equitem nostrum adhuc praesentem amplissimis decorare honoribus. Si medici suum vindicant qui in medicina plurima perspexerit, qui mirabiliter scripserit, qui juniores ardore eodem accenderit, non omnem illum concedemus, qui totius Universitatis sit proprius, qui alumnos nostros noluerit a litteris abhorrere humanioribus et arte scribendi carere, qui ipse praecipue Graecis et Latinis gavisus sit. Cum talem virum elegerint Medici Britannici ut conciliis suis praesideat, auguramur conjunctionem illam, quae semper exstiterit inter artes altiores, duraturam esse.

[We are glad to crown with our highest honour our Knight here present, who for many years has been at the head of our Medical School. Though medical men may claim him as their own, since he has looked deeply into many aspects of medicine, has written admirably about them, and has fired young men with his own keenness, yet we do not altogether give him up to Medicine; in truth he belongs to the whole University; he would not wish our alumni to be ignorant of polite literature or wanting in the art of writing, and is himself one to whom Greek and Latin afford a peculiar joy. When the British Medical Association chose such a man to preside over its deliberations, it was safe to prophesy that the alliance which has always existed between the nobler arts would continue.]

DR. JULES BORDET,
Professor of Bacteriology, Parasitology, and Epidemiology in the University of Brussels.

Linguam novam sibi finxerunt medici, Graeca derivatam, Latina temperatam, barbarismo decoratam. Inter toxica et antitoxica, inter haemolysin et bacteriolysin, titubat Latinitas, verba quae, ut ad poetam nostrum refugiam Cantabrigiensem, obtutu anhelantem defigerent Quintilianum. Quid ergo dicam feci-se hospitem nostrum qui inter res ipsas versatus est verbis mirabiliores? Post medium aevum morbus quidam inter exercitus non sine Baccho bacchatus est, contagiis communicatus. Diagnosin noster festinavit, sanationem maturavit, tabem refrenavit. Si plura requiratis, adest; ipsum rogitate!

[Medical men have fashioned for themselves a new language derived from Greek, tempered by Latin, decorated with barbarisms. Their Latinity staggers between toxic and antitoxic, between haemolysin and bacteriolysin, words which, to have recourse to our Cambridge poet, would have made Quintilian stare and gasp. What, then, can I say of our guest, who has busied himself with things even more remarkable than the words? After the Middle Ages a certain disease, not without the help of Bacchus raged among armies and was communicated by contagion. Our guest made the diagnosis more rapid, hastened the cure, and checked the plague. If you want to know more he is present; ask him.]

DR. SIMON FLEXNER,
Director of the Rockefeller Institute for Medical Research.

Mos est Americanorum, qui divitias congesserunt, non minimam partem doctrinae dedicarae. Johannes Rockefeller ergo scholam instituit, in qua morbos et pestilentias investigarent medici et quibus causis oriundae sint, quibus remediis aptissime expellantur, determinarent. Huic primam institutae praefectus est ante annos septemdecim medicus, urbe illa natus quam ad caractacas fluvii Ohio inter silvas Indosque fundavit Georgius Rogers Clark. Sed haec prius fuere; multis in rebus rem publicam bene gesserunt Kentuckyenses, nec minime in medicina.

[It is the custom of Americans who have amassed wealth to dedicate no small part thereof to learning. Thus John Rockefeller founded a school for medical men in which they could investigate diseases and pestilences and determine from what causes they arise and by what remedies they may best be got rid of. He who has been from the first, for seventeen years, the Medical Director of this Institute was born in the city (Louisville, Kentucky) founded by George Rogers Clark, in a then wild country near the falls of the Ohio River. But this was a long time ago, and the people of Kentucky have done much for the public weal, not least for medicine.]

DR. PIERO GIACOSA,
Professor of Experimental Pharmacology in the University of Turin.

Senator adest Romanus, hos quadraginta annos Medicinae deditus, nec Anglis ignotus, ut qui inter Universitates multum vagatus sit alienorum, quo Medicinae scholas Italicas in melius promoveret, et debiti antiqui quasi fenus reposceret. Scit enim quantum Italis debeamus qui Magistros Salernitanos ediderit. Nec debitum nostrum augere recusat qui multum inter nives moratus Alpinas accuratius investigaverit quomodo et hominum et animalium corpora frigore magno afficiantur.

[A Roman Senator devoted for forty years to medicine is here: he is not unknown to the English; he has visited many foreign universities so as to improve the Italian medical schools and thus, as it were, to claim the payment of the interest on an old debt. He knows indeed how much we owe to the Italians who gave us the Masters of Salerno. Nor has he hesitated to make our debt greater by dwelling long among the Alpine snows to investigate with more accuracy the effect of great cold on men and animals.]

SIR GEORGE MAKINS, G.C.M.G.,
President of the Royal College of Surgeons of England.

Chirurgorum Collegii Regalis Praeses multos per annos Anatomiae studiis intentus, Hospitalis Sancto Thomae dedicati minister, adest, qui Britanniae suae duobus in bellis maxime scientia sua subvenit, multos injuriis vulneribus dolore liberavit, multos spe vitae inspiravit nova. Olim in montibus delectationem strenuam quaesivit, interdum inter rivos otiosam, semper in hortis suis voluptatum purissimam. Aegrotis, collegis, discipulis carus, festinare omittit, aequo animo aegit, semper par laboribus exstitit, multum scientiam provexit.

[The President of the Royal College of Surgeons, for many years devoted to the study of anatomy, who has long served St. Thomas's Hospital, who has greatly helped his country by his science in two wars, who has freed many from injuries, wounds, and pain, and has inspired many with a new hope of life, is here. In times past he sought a strenuous pleasure among the mountains, at other times a more leisurely happiness by the river bank, and always found delight in his garden, that purest of pleasures. Beloved by his patients, his colleagues, and his pupils, he never hurries, but works with equanimity; he has always been equal to his task, and has greatly advanced science.]

SIR NORMAN MOORE, BT.,
President of the Royal College of Physicians of London.

Exstat apud Regimen Sanitatis Salerni regula antiqua et optima:

Si tibi deficiant Medici, Medici tibi fiant
Haec tria; mens hilaris, requies, moderata dieta.

Dietam moderatam inter hanc pretiorum immanitatem nemo frustra requiret. Dum quidquid lucri feceris spoliat aerarii cancellarius, quiescendum est melius. Mentem tibi hilarem praestabunt hospitis nostri historiae, in quibus narratur ut apud Anglos post Raheri hospitale Sancto Bartholomaeo consecratum per haec septem secula floruerit medicina. Qui opera confecerit tanta humanitate, talibus facetiis, tanta doctrina, libenter hodie honoramus.

[There is in the *Regimen Sanitatis Salerni* an ancient and excellent rule: "If doctors fail you there are these three doctors—a cheerful mind, rest, and moderation in diet." No one will have any difficulty in obtaining a moderate diet in these days of high prices. At a time when the Chancellor of the Exchequer will deprive you of your gains, it is better to repose. You will win cheerfulness of mind by reading the history our guest has written in which he has told how medicine has flourished among the English during the seven centuries since Rahere's hospital was consecrated to St. Bartholomew. To-day we gladly honour the man who has accomplished this work with such good taste, wit, and learning.]

THE RECEPTIONS AT CAMBRIDGE.

A VERY full programme of receptions, entertainments, excursions, and other forms of recreation, had been arranged by the various local committees in charge of this part of the meeting. On Saturday, June 26th, the members of the Representative Body were soothed with good music at a smoking concert in the Hall of Gonville and Caius College, and on Sunday afternoon they were most pleasantly entertained in Downing College at a garden party given by the Master and Mrs. Seward, and had an opportunity to meet members of the local Branch

of the Association. The rain, which fell heavily at night, came just too late to prevent the visitors from airing themselves in the college grounds. On Monday the Representatives settled down again to serious business, and no distractions were provided. Tuesday was a "scarlet day," to use the Cambridge term, for in the afternoon there was a Congregation for honorary degrees in the Senate House; academic dress was again worn at the President's Address and presentation of foreign guests and oversea delegates in the Senate House, and at the reception given in King's College by the Cambridge and Huntingdon Branch. The evening was fine, and the grounds and buildings of Henry VI's college, dominated by his glorious chapel, formed a perfect setting for an occasion of this kind. The guests were received on the lawn by Dr. W. R. Grove, President of the Branch, and Sir Clifford Allbutt's portrait was presented to him in the College Hall by Sir Norman Moore, P.R.C.P., on behalf of the medical profession, as recorded in our last issue. The reception in Emmanuel College on Wednesday evening by the Vice-Chancellor of the University (Dr. Giles) was an overwhelming success. The grounds of King's slope towards the river, the Emmanuel grounds are set off by a lake; thus each college has its individual charm and lends the quiet beauty of grey buildings, green lawns, trees and water, as a foil to the kaleidoscopic colours of doctors' robes and evening frocks. On Thursday afternoon the Mayor and Mayoress of Cambridge, Mr. and Mrs. G. P. Hawkins, gave a reception in the grounds of Christ's College, lent by the Master and Fellows. This agreeable garden party was attended by more than 2,000 guests, and, as happened on the evening before, the rain held off long enough not to spoil the affair. Very many visitors were glad to have the chance to visit the college of Milton and Darwin, and to walk through the grounds to the famous mulberry tree and the bathing pool, with its classic ornaments and overhanging trees. On Friday evening, under a clear sky, the grounds of Trinity College were opened for a reception by the Master and Fellows. Entering through the Great Gate and passing through the Great Court, which has no rival anywhere, the guests made their bow in the Hall to the Master, Sir J. J. Thomson, O.M., P.R.S., and then wandered at their sweet will through the courts and cloisters, or across Trinity Bridge to the gardens beyond. Each of these receptions in college grounds will be accounted a red letter event in the recollection of all who attended.

THE CHURCH SERVICES.

On Tuesday afternoon a special service for members of the British Medical Association was held in Great St. Mary's, the University Church. The service was attended in state by the Mayor of Cambridge and the other civic authorities, and there was a large congregation of medical men and women. The lesson was read by Professor Sir Clifford Allbutt, President of the Association, and the sermon was preached by the Right Rev. F. H. Chase, D.D., Bishop of Ely. The Bishop took his text from the Epistle to the Romans, viii, 29. Doctors especially, of all people, he said, plumbed the depths of human suffering; they came in contact with all sides and degrees of humanity, and saw man racked and tortured by pain, both mental and physical, and to those who saw humanity at its lowest ebb, in the grip of terrible pain, the question must present itself: "How can we reconcile suffering with the love of God?" The explanation lay in the love of God, for that love sprang from suffering and the knowledge thereof. God's infinite pity and compassion was the outcome of suffering, for in the person of Christ he had known the lowest, most awful depths of suffering that man could experience. When the service was over the Mayor and members of the Corporation returned in procession to the Guildhall.

By arrangement with the Guild of St. Luke, St. Cosmas, and St. Damian, a special Mass for the Roman Catholic members of the Association was celebrated at 9 o'clock on Wednesday morning in the Church of Our Lady and the English Martyrs. Those present included Lieut.-Colonel Apthorpe Webb, representing the President of the Association. The preacher was the Rev. Father Flynn, M.A., Professor at St. Edmund's College, Ware, who took as his text 1 Cor. xv, 19. He said that Catholic doctors had an apostolate to carry out; they were to save souls through bodies and to use their influence to see that the profession worked to a Christian standard. Quoting a well-known couplet from Robert Browning, he remarked that if doctors neglected their singular opportunities for good, they were liable to lose their own souls. They should ever plead, in the name of sound science, for Christian ideals in the practice of medicine. He believed that the trend of medical opinion, if carefully observed, would show that the most advanced opinion was tending to an ever close alignment with the teachings of the Church. When defeated as doctors—as sooner or later in every case they must be—let them not forget that they still could snatch from death his spoils.

On Wednesday, June 30th, at 5 o'clock, a special Free Church service was held in Emmanuel Congregational Church, Trumpington Street. The preacher was the Rev. M. E. Aubrey, M.A. There was a large congregation of members of the Association and other visitors; many were in academic dress. On Wednesday, Thursday, and Friday evenings organ recitals were given in King's College Chapel; this opportunity of hearing music in "the crowning glory of English art" was deeply appreciated by large numbers of visitors.

ROOMS IN COLLEGE.

To many members of the Association an enjoyable feature of the Annual Meeting last week was the fact that they were able to lodge in one or other of the colleges. The authorities of each college very kindly placed at the disposal of the local committee a large number of sets of undergraduates' rooms, and these were assigned to members unaccompanied by ladies. They were thus able to live in college and take their meals at the high table in the college hall. To old Cambridge men it was very pleasant to lead again something of the student life in the picturesque college buildings; and many other visitors who had never stayed in Cambridge before were able to see the colleges from within under most agreeable conditions. The hospitality of the college authorities was highly appreciated on all sides. The local committee had conceived the happy idea of grouping within a particular college members interested in the work of the same scientific section. Thus Trinity held many of the Neurological Section, Sidney entertained a number of obstetricians, and Caius housed a group of specialists in tropical disease. In this way men who had known each other hitherto only in print or in public debates were able to meet and discuss their work informally in their rooms or in the college Combination Room hospitably placed at their disposal by the Fellows. A few of the colleges even went so far as to admit to meals in Hall the ladies accompanying members, somewhat to the dismay of old college servants brought up in the ancient monastic traditions of college life.

THE TEMPERANCE BREAKFAST.

On Thursday morning, July 1st, members of the Association attending the meeting were entertained to breakfast by the National Temperance League in the rooms of the Cambridge University Union Society. This, the fiftieth conference of the kind, was presided over by the Rev. T. C. Fitzpatrick, D.D., President of Queens' College. The after-breakfast speakers were Sir G. Sims Woodhead, K.B.E., Professor of Pathology in the University, and Mr. W. McAdam Eccles, both Vice-Presidents of the League; Dr. T. N. Kelynack, Honorary Secretary of the Society

for the Study of Inebriety; and the Rev. C. C. Weeks, M.R.C.S. The President of Queens', in a few opening words, remarked that he himself had been a teetotaler all his life; he urged the advocates of temperance to be temperate in all things, even when addressing their fellow men. Professor Woodhead said that the League was a strong though not a numerous association; almost all its recruits came from hard-working, earnest young students at the hospitals holding prominent positions in the athletic world—men of strong character, who were able to lead those with whom they associated. Mr. Eccles indicated the bearings of war and prohibition on the medical aspects of the alcohol question. The public, he said, looked to the medical profession for no uncertain judgement as to the value of alcohol, and it behoved every doctor to study the matter from the national, economic, and physiological standpoints. Dr. Kelynack said that the executive committee of the League believed it to be still necessary to bring to bear on the alcohol problem the two great forces of education and research. It was incumbent upon the profession to encourage and take part in the investigations which would still further elucidate this question. Mr. Weeks, referring to the vast amount of defective health among the young men of the nation, said that, while not claiming that this was all the result of alcohol, the League was unfalteringly convinced that behind it there was the great influence of alcohol. Sir Clifford Allbutt, proposing a vote of thanks to the Union Society for lending its room and to the chairman and other speakers, said that during the twenty hardest years of his life, when he practised at Leeds, he touched no alcohol, and knew he was much the better for so doing.

THE IRISH GRADUATES' LUNCHEON.

THE Irish Medical Schools' and Graduates' Association gave a lunch at the Lion Hotel, Cambridge, on July 1st, when Dr. W. Douglas presided. The loyal toast having been duly honoured, Dr. Douglas said that they had not assembled for speech making but to meet old friends, and in the name of the Association he greeted those present with a hearty welcome. He said it was now six years since they had their last formal luncheon at Aberdeen. Six years of war and trouble had intervened, and they had now to make the best of a revolutionary world. The summer general meeting of the Irish Medical Schools' and Graduates' Association was held on the same afternoon, when it was announced that the Council had elected a committee to bring the association to the notice of those alumni of the Irish schools of medicine who had not yet been enrolled. It was reported that these efforts had already borne good fruit, and that there was every reason to hope that quite a thousand names would be on the roll before the next annual meeting, to be held in London on St. Patrick's Day, 1921.

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

THE Anatomical Society held its summer meeting in the Anatomical Department of the University of Cambridge on July 2nd and 3rd, in conjunction with the meeting of the British Medical Association. The president of the society, Professor Arthur Keith, occupied the chair, and there was a large attendance of members. Many of the papers read were of direct interest to medical men. One of the most striking communications was made by Dr. Sansom, who showed that in the ovary of one of the commoner voles ova were found which had undergone an abortive parthenogenetic division. This discovery is of great interest in relation to the observations of a similar kind which Professor Arthur Thomson has made on human ovaries and published in the *Journal of Anatomy*. A series of papers contributed by Dr. R. A. Dart, Colonel J. Shellshear, D.S.O., and Dr. T. Woolard extended the observations which Professor Elliot Smith has made concerning the evolution of the corpus striatum and its relation to the olfactory lobe. Mr. W. E. Le Gros Clark gave an account of the development and evolution of Pacchionian bodies, his results confirming the part played by these bodies in the absorption of cerebro-spinal fluid. Professor Douglas Derry described a method of measuring the essential difference between male and female pelves in the region of the sacro-sciatic notch. Professor J. E. Frazer showed that Wharton's duct is developed by the inclusion of a groove or fold which appears on the floor of the mouth of the human embryo. Mr. Ralph Thompson exhibited photographs and *x* rays of a case of epispadias where he had re-made the bladder and introduced an acting muscular sphincter by transplanting part of the rectus abdominis. Dr. D. M. S. Watson gave an account of the earliest land vertebrates, the material on which his conclusions were based being derived from coal measures in the North of England. Through the kindness of the Master and Fellows of Jesus College, the members of the society were able to hold their annual dinner in the Hall where Malthus and Coleridge had been students.

THE AMERICAN HOSPITAL IN LONDON.

THE Board of Governors of the American Hospital in London entertained Dr. Charles H. Mayo at dinner at Claridge's Hotel on July 6th. The Earl of Reading presided over a company numbering about one hundred, including a number of Americans resident in London and many members of the medical profession. The Chairman, in proposing the health of the guest, said that he was quite sure that Dr. Charles Mayo would not like his name to be severed from that of his brother, with whom he had always been so closely associated. The name of the Mayo brothers was a household word wherever medical education and research were honoured. The Mayo Foundation was a very great achievement, and this institution with its endowment and equipment was transferred by the brothers two or three years ago to the University of Minnesota, so that the students of the university had the enormous advantage of access to its resources. Lord Reading went on to refer to the constant interchange of men and ideas between the two great English-speaking countries. A man who achieved fame on one side of the Atlantic achieved it on the other. The wonderful Rockefeller gift to University College Hospital and University College further tended to narrow the ocean which separated but could not divide, and he believed that the institution of the American Hospital in London would be another small link in the chain which bound the two countries together. Dr. Charles Mayo, in responding to the toast, referred to the heredity of Americans, which was mainly British, even as English was the dominant language in the States. The bond of friendship which existed between the two peoples could now never be broken. He went on to speak of the great services which medicine had rendered in the war. The thing about the war which would be longest remembered and upon which men would be most agreed was the humanitarian achievements of medicine and surgery. In the development of the American Hospital in London he saw another proof of Anglo-American unity. He concluded his brief and modest speech with a tribute to the late General Gorgas. Mr. A. J. Balfour, in proposing the toast of the American Hospital in London, said that science in general was coming more and more into touch with human interests, economic and other, but of all the sciences the group related to medicine touched humanity most nearly. The institution whose prosperity he proposed would be a scientific link between the two great English-speaking peoples. It would give them a common stock of medical ideas and practice. This could not be brought about by reading alone, but necessitated personal intercourse, and this the hospital

would provide. While in Paris he had learned that, although only eight hours' journey separated the medical schools of Paris from those of London, the schools of either capital had much still to learn from those of the other. This was still more the case over the greater distance of the Atlantic. Mr. Balfour went on to speak of the advances which had taken place in medicine in his time, and said that the number of collateral sciences now brought into medicine must mean that the next or the succeeding generation would see an advance upon our present knowledge of which we could at the moment form not the slightest conception. The American Ambassador, responding to the toast, said that he only wished he were responding for a hospital of brick and mortar, with its corridors filled with nurses and its dispensary with drugs; but, although it was not yet a tangible and visible structure, all of them looked forward to its ultimate erection. The hospital would be a home in London for American medical inquirers; it would help to relieve the crying need for more hospital accommodation in the metropolis, and it would be an open and public memorial of the fact that not only were the governmental relations between the two countries harmonious, but that their peoples were sensible of each other's ills. Mr. Davis paid a tribute to General Gorgas, who had left behind him a lasting and inextinguishable claim upon the gratitude of mankind. Few men left the world with the world so deeply in their debt. The people of America would find a solemn consolation in the memorial service which the British Government has spontaneously arranged in St. Paul's Cathedral. Sir W. Arbuthnot Lane also responded to the toast, and prophesied great gain to science from the American Hospital in London. The committee on the other side of the Atlantic included some of the most energetic spirits in the United States, and there were no greater names in American medicine and surgery than those who constituted the medical subcommittee of five. The health of the Chairman was proposed by Mr. Newton Crane and briefly acknowledged by Lord Reading.

THE NEW INSURANCE ACT.

THE National Health Insurance Act, 1920, came generally into force on July 5th. It raises the weekly contribution in Great Britain from 7d. to 10d. in the case of men, and from 6d. to 9d. in the case of women, 2d. of the increase being in each case borne by the employer and 1d. by the worker. The normal rate of sickness benefit is increased from 10s. to 15s. a week in the case of men, and from 7s. 6d. to 12s. in the case of women. The rate of disablement benefit is increased from 5s. to 7s. 6d. for men and women, and the amount of maternity benefit from 30s. to 40s. The income limit is raised from £160 to £250. The specific provisions with regard to sanatorium benefit are discontinued except as regards Ireland. Treatment and attendance in respect of tuberculosis is included in ordinary medical treatment and attendance. The contribution from insurance funds towards the cost of medical benefit is increased to 9s. 6d. a year for each insured person, to include drugs as well as attendance, and a further sum for this purpose will be provided by a special grant out of public funds.

THE OSLER MEMORIAL.

THE committee which desires to erect an Osler Institute of General Pathology and Preventive Medicine in Oxford to commemorate the distinguished services of Sir William Osler in Canada, in the United States, and in this country, is about to issue an appeal for funds. The general committee contains representatives of the Universities of Aberdeen, Birmingham, Bristol, Cambridge, Durham, Edinburgh, Glasgow, Leeds, Liverpool, London, Oxford, Sheffield, and Wales, and also of the Royal Colleges of Surgeons and Physicians, of the Faraday Society, of the British Association, and of the British Academy. Dr. William Collier, ex-President of the British Medical Association, and Sir Walter Fletcher, Secretary of the Medical Research Council, are also members. We hope to recur to the matter in an early issue.

WE regret to announce the death of Dr. Montagu Handfield-Jones, consulting obstetric surgeon to St. Mary's Hospital.

THE Cameron prize of the University of Edinburgh has been awarded to Sir Robert Jones in recognition of the highly important advances he has made in orthopaedics and his many valuable contributions to the literature of the subject during the past five years. One of the conditions attached to the prize is that the recipient shall give a lecture or course of lectures in the university. The prize was founded in 1878 by the late Dr. A. R. Cameron, of Richmond, New South Wales. It is of the value of about £150, and may be awarded annually to a person who within the previous five years, has made important and valuable additions to practical therapeutics. The first recipient was Pasteur, the second Lister. The prize has not been awarded since 1915, when it was given to the late Sir Lauder Brunton.

Medical Notes in Parliament.

Medical Examination of Women Claimants for Pensions.—Dr. Murray, on July 1st, asked whether cases had occurred in which women, on applying for pensions on the ground that they had been deprived of the support of a male relative killed in the war, had been called upon to undergo medical examination in order that their fitness to go to work might be tested. Mr. Macpherson said that Dr. Murray probably had in mind those pensions to dependants which were, under the Royal Warrant, conditional upon incapacity of self-support through infirmity or age. Where the evidence on this point was open to doubt, it was the practice to ask for a medical certificate, which was ordinarily given by the applicant's usual medical attendant. He did not consider that this procedure entailed hardship. Dr. Murray asked whether, in the case of a mother whose son contributed to the family exchequer and had been killed, it was the policy to see that the woman was medically examined as to her fitness or otherwise for work. Mr. Macpherson said that in a case where a woman was able to do work, it was right the Department should ask whether she was fit or not. Dr. Murray inquired if the grant of a pension was prejudiced by capacity to work. Mr. Macpherson answered that if the woman was dependent on the man who was killed she got the grant irrespectively. There was no question of forcing a woman to work. In the case of a young woman it was no hardship to ask her to do work and to give a pension which was appropriate. If she were quite unable to work, the Department was anxious to get a certificate from her own medical officer.

The Medical Use of Spirits.—In Committee on the Finance Bill, on July 5th, Mr. Leonard Lyle moved an addition to Clause 4 with the object of obtaining a reduction of duty in respect of spirits used in hospitals. The clause as it stands provides for a reduction of duty on spirits only when used in medical preparations or for scientific purposes. Colonel Burn seconded the amendment, remarking that everyone knew how serious was the position of hospitals at the present time. Mr. Kiley, supporting the amendment, called the attention of Mr. Chamberlain to the existing arrangements. If the spirit was mixed with drugs and was bought from a drug dealer, then the duty was partially remitted; but if the spirit was mixed with water instead of with drugs the duty had to be paid. He felt sure it was not the intention of the Chancellor to penalize the hospitals nor to induce them to mix the spirit with other substances to evade the duty. Mr. Baldwin, Financial Secretary of the Treasury, said in the case of duties such as those on spirits and on wine, which had now reached so high a point, the Treasury had to take the greatest possible care not to leave open any possible means of evasion. The case of hospitals had been met to a considerable degree in past finance bills, and the relief had been continued by allowing them spirits at a pre-war rate where spirits were used in medicinal preparations. Statutory grants were given by the Ministry of Health to certain hospitals in relief of the duty on alcohol used in connexion with certain medicinal preparations, but it had always been ruled administratively that this relief was not to be given in the case of potable spirits. Exactly the same administrative difficulty arose in regard to wine. Dr. Murray regretted the decision, and thought there was not much force in the objections raised by Mr. Baldwin. In all well-regulated hospitals the quantity of spirit which a patient got was registered in a book. It would not add much to the expense of the Excise Department if these books were occasionally examined. Any leakage could thus easily be detected, and a hospital found guilty could be punished. Mr. Preston, as representative of the constituency containing the largest hospital in London, also deplored the Treasury refusal to meet the appeal. On a division, 61 members voted for the amendment, and 195 against

Small-pox in Glasgow.—Mr. R. Young asked, on July 1st, whether any other measures had been taken in Glasgow besides the removal of cases to hospital, isolation of contacts, and free vaccination, to deal with the small-pox outbreak. Mr. Munro replied that the main additional measures taken by the public health authorities were: House-to-house visitation in infected areas, daily visitation of contacts during the incubation period, attention to general sanitation and public cleanliness, disinfection of houses, clothing, and bedding of cases and contact, and daily disinfection of tramcars. In addition every effort had been made to trace sources of infection in every known case.

Registration of Births in Scotland.—In reply to Dr. Murray, on July 5th, the Solicitor-General for Scotland said that the powers of town councils to make rules and regulations for registrars of births were contained in the Registration of Births, Deaths, and Marriages (Scotland) Acts, 1854 and 1856. These Acts provided for the election of registrars by town councils, regulated the tenure of office (the registrar being removable by the sheriff moved thereto by the town council or by the Registrar-General), and provided for remuneration of registrars. Registrars acted under the direction of the Registrar-General, and were under the general control and superintendence of the sheriff.

Officers' Dependants' Allowance.—Mr. Macpherson stated, on July 1st, that the Government has decided not to give a flat rate allowance for wives of disabled officers, but that allowances should be granted in case of need by the Special Grants Committee, both for wives and children. The increased maximum rates for children and the maximum allowance for wives recommended by the Select Committee had been approved, and were now being administered by the Special Grants Committee.

Answers in Brief.

It was agreed, on July 2nd, that the Viscountess Astor, Sir Thomas Bramsdon, Dr. A. C. Farquharson, Mr. Maddocks, Colonel Parry, and Mr. Wignall be nominated House of Commons representative members on the joint Committee of Lords and Commons to consider the Criminal Law Amendment Bill, the Criminal Law Amendment (No. 2) Bill, and the Sexual Offences Bill.

In the absence of further outbreaks of rabies or unforeseen complications, the Wallingford area may towards the end of next month be freed from muzzling restrictions, and the areas in Glamorgan and Kent may be freed at the beginning of August and September. The position in Surrey and round Colchester is more difficult owing to a recurrence of disease in February and April last respectively. But it is hoped to make further, if not complete, relaxations in the early autumn.

The 20 per cent. allowance on army officers' pensions to meet the increased cost of living ceased on April 1st, 1920, but the rates of retired pay contained in the new warrant to take effect from the same date will afford equivalent benefit. The Paymaster-General has accordingly been authorized to continue the payments on the same basis for the quarter ending June 30th—that is, until the new warrant is expected to come into force.

The arrangements for the new local organization which is taking the place of the Food Control Committees will, it is expected, bring about a reduction of staff of about 3,400.

Correspondence.

THE FUTURE OF CONSULTANTS.

SIR,—Readers of the debates at the Representative Meeting as reported in the SUPPLEMENT will have noticed a remark by Dr. C. O. Hawthorne that "Dr. Brackenbury, with the aid of the Ministry of Health, was looking forward to the prompt extinction of consultants." To those who know Dr. Hawthorne this will be recognized as an example of his effectively genial way of putting things, but for the sake of those who may not recognize this I should be glad if you would allow me, in a sentence, to disclaim any such malign wish or aim, and to explain my conception of the essential place of the consultant in the medical scheme of things entire.

I regard the consultant as one who properly should see patients only in association with a general practitioner, and who should be primarily a help to the competent rather than a refuge for the incompetent. I am happy to believe that large numbers of consultants approve of this position.—I am, etc.,

London, N., July 4th. HENRY B. BRACKENBURY.

A BLIND ALLEY.

SIR,—I am somewhat puzzled by the letter of "One of Them" in your issue of July 3rd, p. 29. He acknowledges himself to be a person of mediocre ability collecting unreliable statistics, but why does he not speak for himself alone, especially as he finds obvious reasons for concealing his identity?

I find difficulty in understanding the relation between a mediocre ability and the alleged unreliable statistics. Does "One of Them" think a man of mediocre ability (by which I take it he means ability neither above nor below the average) is incapable of collecting reliable statistics? If so, I think he will find few to agree with him. Personally I find no reason to think the statistics are unreliable.

There is abundance of material awaiting investigation. What is required is a closer association between all school medical officers, and I am sure the result would be an important increase in the value of our work.—I am, etc.,

W. DUNCAN LAWRIE, M.D., F.R.C.S.Ed.,
Assistant School Medical Officer,
Stoke-on-Trent.

July 3rd.

"THE MEDICAL DIRECTORY," 1921.

SIR,—The annual inquiry form has been posted to every member of the medical profession whose address is known to us. If the form has failed to reach any practitioner a duplicate copy will be forwarded upon application.—We are, etc.,

THE EDITORS OF "THE MEDICAL DIRECTORY,"
7, Great Marlborough Street, London, W.1.

July 5th.

Obituary.

WILLIAM CRAWFORD GORGAS, K.C.M.G., M.D., D.Sc., LL.D.,

Surgeon-General, United States Army; President of the American Medical Association.

WE have to record with great regret the death of Surgeon-General William C. Gorgas, of the United States Army, which took place in the nursing home for senior officers at the Queen Alexandra Military Hospital, Millbank, in the small hours of Sunday morning, July 4th. He was taken ill some weeks ago while passing through this country on his way to the west coast of Africa to investigate the prevalence there of yellow fever, a disease with which his name will always be associated. During a visit to the Hospital on June 8th, the King called on General Gorgas and invested him with the insignia of K.C.M.G. in recognition of his services to the British Empire and to the commercial world, especially for the work he did as Chief Health Officer during the construction of the Panama Canal. After abolishing yellow fever from Havana General Gorgas made his name famous throughout the world by eliminating yellow fever and malaria from the Panama Canal zone, and thus rendering possible the construction of the Canal.

William Crawford Gorgas was born at Mobile, Alabama, on October 3rd, 1854. He was the son of Brigadier-General Josiah Gorgas, Chief of Ordnance of the Confederate Army; on both sides he came of old Southern stock. He received his medical education at Bellevue Medical College, New York, and the Southern University in Tennessee. Having graduated M.D., he entered the Medical Corps of the United States Army, at the age of 28, with the rank of assistant surgeon. He served in various parts of the country, and during his period of duty in Western Texas he first approached the problem of yellow fever, then rife in that district, and was himself infected with the disease. When the war with Spain broke out he served with the army in Cuba, and was later made Chief Sanitary Officer of Havana, at that time a hotbed of yellow fever. During his tenure of this office Gorgas, carrying out the recommendations of the American Yellow Fever Commission of 1900, evolved methods for suppressing the mosquito (*Stegomyia fasciata*), and thus in less than a year freed Havana from yellow fever for the first time in history. In recognition of this work a special Act of Congress was passed promoting him to the rank of Colonel, and appointing him Assistant Surgeon-General of the United States Army.

In 1904 the United States undertook to complete the construction of the Panama Canal which had baffled the French. Gorgas was sent to the isthmus to report on the sanitary condition of the Canal zone, and was made Chief Health Officer of the area, which for 400 years had had the reputation of being one of the unhealthiest regions in the world. He was given a free hand and full responsibility. By the bold and energetic methods he adopted for draining the land and oiling the mosquito breeding-places of this plague-spot, Gorgas stamped out yellow fever in two years and enormously reduced the mortality and sickness rate from malaria. This, the greatest labour of his life, earned

for him the cognomen "a Hercules of modern hygiene," for he cleansed places compared with which the Augean stables were sweet and wholesome.

Gorgas's great work, based on the labours of Manson and Ross, received full and immediate recognition in this country. Among other honours the Royal Society awarded him the Buchanan Medal in 1912, for his sanitary administration of the Panama Canal works; the University of Oxford conferred upon him its honorary D.Sc. degree; and the Liverpool School of Tropical Medicine its Mary Kingsley Medal. In 1914, the year in which he was promoted Major-General and appointed Surgeon-General of the United States Army, he was entertained in London at a complimentary dinner, presided over by Sir Thomas Barlow, then President of the Royal College of Physicians, and attended by many leaders of the medical profession in London and by officers of the military medical services. Only three weeks ago we announced that in connexion with the Annual Meeting of the British Medical Association, the University of Cambridge proposed to confer upon General Gorgas the degree of LL.D. *honoris causa;* and he was one of the distinguished foreign guests whom the Association invited to take part in the scientific proceedings and be received by the President on June 29th in the Senate House.

On the completion of the great inter-oceanic canal, Gorgas was made Director of the International Health Board of the Rockefeller Institute, with his head quarters at Washington, and visited many tropical countries preaching the gospel of hygiene. When war was declared between the United States and Germany he undertook the organization of the medical service. In September, 1918, he went on a short tour of inspection in France, but retired under the age rule in the following month.

The funeral service is to be held this day, Friday, July 9th, at noon, in St. Paul's Cathedral, with full military honours. The body will afterwards be taken in an American warship to the United States, and the interment will probably take place at Arlington, near Washington, the national cemetery of the United States Navy and Army.

Universities and Colleges.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

ELECTION OF MEMBERS OF COUNCIL.

A MEETING of Fellows of the College was held at the College on July 2nd, Sir George Makins, the President, being in the chair, for the purpose of electing three Members of Council. The total number of votes was 791; only 6 Fellows voted in person. The following was the result of the poll:

	Votes.	Plumpers.
SIR ANTHONY A. BOWLBY...	473	9
SIR D'ARCY POWER	383	3
F. J. STEWARD	329	58
W. Thelwall Thomas	240	22
Victor Bonney	190	17
J. Herbert Fisher	180	28
H. S. Pendlebury	164	11

The President declared that Sir Anthony Bowlby and Sir D'Arcy Power had been re-elected and that Mr. F. J. Steward had been elected Members of the Council. Mr. H. J. Price and Mr. Willmott Evans acted as scrutineers.

UNIVERSITY OF EDINBURGH.

THE following have been approved at the examination indicated:

M.B., CH.B.—H. Alexander, R. L. Baikie, P. Barlow, G. S. Barnett, C. F. Beyers, S. Borochowitz, F. G. H. Brown, K. S. Brown, H. W. Burne, R. M'D. Cairns, Grace S. Calver, A. Campbell, Helen Campbell, H. Cohen, Dorothy Court, J. R. Crolius, M. Danziger, J. Davidson, J. H. Dick, Margaret L. Dobbie, H. J. C. Durward, J. H. Fairweather, O. Fitzpatrick, Elizabeth S. Forbes, Dora W. Gerrard, G. M'K. Gibbon, Mary L. Gilchrist, J. A. Gillison, M. S. Goldberg, Jessie Gordon, *Janet Grant, A. W. P. Haine, J. E. Haine, A. J. C. Hamilton, C. M. Hawick, J. P. Hope, J. P. Immelman, W. Isbister, W. Kantor, Eleanor H. Kelly, D. J. A. Kerr, Ba Kin, S. Levey, J. A. L. Loudon, D. I. O. Macaulay, J. F. M'Conchie, A. G. MacGillivray, Agnes M. Macgown, Agnes R. Macgregor, H. Mackay, Florence E. M'Kenzie, J. R. Maclean, J. M'Leman, Jane MacLennan, Annie S. MacLeod, J. S. B. M'Neil, P. B. Malherbe, V. G. Massie, R. M'K. van der Merwe, C. B. F. Millar, Christine G. Mitcheson, D. J. Morrison, Emily M. Mure, A. R. Murray, D. J. T. Oswald, W. P. Petrie, K. M. Purves, J. C. Rabie, C. B. Reekie, Ruth J. D. Ritchie, Hera Ross, Annie M. Roxburgh, C. W. Rubidge, Louie A. Rubidge, Helen M. Russell, H. J. E. Schultz, T. Scott, C. Shapiro, G. A. Sinclair, W. A. Sinclair, P. B. Smale, Alice B. S. Smith, Dorothy M. Smith, T. Sprunt, I. M'L. Thompson, H. Thomson, Mabel Thomson, Marjorie Thomson, D. L. M'R. Tod, J. C. Truter, T. C. Wakefield, Grace Walker, Edith G. Wilkes, A. A. Wilson, J. MacL. Young, W. L. Zeeman.

* Passed with distinction.

UNIVERSITY OF DURHAM.

THE following have been approved at the examination indicated:

THIRD M.B. (*Materia Medica, Pharmacology, and Pharmacy; Public Health; Medical Jurisprudence; Pathology and Elementary Bacteriology*).—*Una M. Mulvany, Sarah B. Allan, A. Angus, S. Annecke, T. H. Bates, H. M. S. Blair, C. C. Carr, Evangeline Carse, J. F. Coltman, R. N. Craig, W. N. Crowe, R. L. Dagger, R. A. McK. Dickson, E. R. Dingle, H. B. L. Dixon, G. A. M. Hall, G. A. Haydock, R. Hickley, E. V. Howard, L. Hunter, Ella Keidan, Elizabeth Killian, Mona Kirkhouse, Hilda Lodge, Ettie O. McCullagh, Mary J. McManus, A. J. Moskow, P. Murphy, P. J. O'Connell, L. N. K. O'Neill, F. W. M. Pratt, J. V. Reuben, Adèle C. Robson, Jessie E. Sheret, G. W. Spark, Gladys Stableforth, T. S. Storey, W. P. T. Watts, J. Whillis, G. Wilson, H. A. Wilson.

* With second class honours.

Medical News.

THE British Orthopaedic Association has unanimously elected King Manuel an honorary member in acknowledgement of his great services to the wounded soldier during the war, especially in the establishment of curative workshops in the special military surgical centres.

DR. W. D. COOLIDGE will give an address to a special meeting of the Röntgen Society, to be held on Thursday next, July 15th, at 9 p.m., at University College, Gower Street, W.C.1. Members of medical and scientific societies are invited to attend.

A COURSE of twelve lectures on neurology will be given on Tuesdays and Wednesdays, at 2 p.m., at the London Hospital Medical Unit, commencing on July 13th, by Dr. Theodore Thompson and Dr. George Riddoch. The lectures are open to students and graduates of the London Hospital and other schools.

A SPECIAL post-graduate course will be held at the North-East London Post-Graduate College, Prince of Wales's General Hospital, Tottenham, from July 19th to 31st. The fee for the course to non-members of the Fellowship of Medicine is £3 3s. or £2 2s. for either week. Further particulars can be obtained from the Dean at the hospital, or the Secretary of the Fellowship of Medicine, 1, Wimpole Street, W.1.

THE emergency grant of £250,000 made by King Edward's Hospital Fund to assist the London hospitals in their pressing need has been distributed among 105 hospitals. The largest amount is £35,000 to the London Hospital. King's College receives £17,500, St. Thomas's Hospital and the Great Northern Central Hospital £12,000 each, the Metropolitan Hospital £11,000, the Middlesex Hospital and University College Hospital £10,000 each, the Westminster Hospital and the West London Hospital £9,500 each, St. George's Hospital £8,500, the National Hospital for the Paralysed and Epileptic and the Hospital for Sick Children £8,000 each, Guy's Hospital £7,000; smaller amounts are granted to other hospitals.

THE EARL OF ARRAN, treasurer of the Children's Country Holidays Fund, makes an appeal for contributions to increase the number of London children who can be given a fortnight in a country village or seaside home. The cost for the board of each child has increased since last year from 9s. to 12s. a week, and the railway companies have raised the fares.

H.R.H. PRINCESS MARY paid an informal visit, lasting about an hour and a half, to the London (Royal Free Hospital) School of Medicine for Women (University of London) on July 1st. She was received by the dean of the school (Miss Aldrich-Blake, M.D., M.S.), the honorary secretary (Dr. May Thorne), and the warden and secretary (Miss L. M. Brooks), and made a complete tour of the building, going into the laboratories where students were at work. The number of students attending the school and the hospitals connected with it this term is about 480.

THE Minister of Health has appointed a Committee to consider and report on the legislative and administrative measures necessary to secure adequate protection for the health of the people in connexion with the slaughter of animals and distribution of meat for human consumption in England and Wales. The members of the Committee are: Sir H. C. Monro, K.C.B. (Chairman), Mr. W. G. R. Boys, O.B.E., Mr. R. B. Cross, O.B.E., Mr. J. Edwards, Dr. W. J. Howarth, C.B.E., Dr. A. W. J. MacFadden, C.B., Councillor T. Masheter, J.P., Mr. A. W. Monro, C.B., Mr. T. Parker, F.R.C.V.S., Mr. R. J. Robinson, and Mr. P. Taylor. Mr. F. H. O. Jerram, M.B.E., of the Ministry of Health, has been appointed Secretary of the Committee, and communications for the Committee should be addressed to him at the Ministry of Health, Whitehall, S.W.1.

THE Medical Research Council has now arranged with the firm of Evans, Sons, Lescher and Webb to place on the market sterilized solutions of gum acacia like those extensively used in military hospitals during the war in the treatment of haemorrhage and shock. It is believed that the experience of the war will have created a demand for these solutions for the purposes of civil surgery, but that many hospitals have been unable to undertake the manufacture of them in their own laboratories. The solutions are made according to the method employed during the war at the Base Hygiene Laboratory, B.E.F., as described in the Medical Research Council's Special Report No. 25. They are made up in special stoppered bottles containing 500 c.cm., and are sold at the price of 1s. 6d. a bottle, *plus* a charge for transport; 6d. is also charged for each bottle not returned when empty. All inquiries should be addressed to Messrs. Evans, Sons, Lescher and Webb, Ltd., at the Bacteriological Research Laboratories, Runcorn.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2631, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*: telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Assceiate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

M. A. W. asks for suggestions for treatment of excessive dryness of the mouth in a man of 70—the salivary glands seem to have ceased to secrete.

INCOME TAX.

A. J. T. bought a car for £250 and spent £75 3s. 11d. on overhauling, painting, and improving the lighting, etc. Can he deduct the second sum as a professional expense? The local inspector of taxes says it cannot be allowed.

*** The inspector's view appears to be that A. J. T. has laid out £325 3s. 11d. in the purchase of a car, and that it is immaterial that the car was first purchased and then renovated. So far as our correspondent's personal position is concerned we are inclined to agree, but a broader view of the facts suggests a different conclusion. If "A" who sold it to A. J. T. had expended the sum of £75 3s. 11d. and *then* sold it for £325 3s. 11d., undoubtedly A. J. T. could not have deducted any portion of it, but "A" could have deducted £75 3s. 11d. as spent on his own car. The result of the inspector's refusal is that the Revenue as a whole gains the tax on the cost of renovating the car as against "A" and A. J. T. combined. We suggest that A. J. T. might bring this point to the inspector's notice, but probably the real hardship is borne by the vendor of the car who gets no allowance for the repairs, etc., due at the date of sale. In any case the expenditure on improvement is not allowable—for instance, in connexion with the electric lighting—and further, any unfair result as regards A. J. T. must be temporary, as it would be rectified when the car in question is replaced.

L. F. B. inquires as to the tax payable on a house owned and let by him, on which he has recently had to expend a considerable sum in respect of his portion of the cost of repairs.

*** As a portion of the repairing cost falls on the tenant the gross rental value on the basis that L.F.B. bore the *whole* of that cost must exceed the rent, and on the facts the valuation of £66 compares not unreasonably with the actual rent of £60. But there seems to be no sufficient reason why the usual deduction of one-sixth should not be made from the gross value, leaving our correspondent in the position of paying tax on £55, whereas it is understood that tax is claimed from him on £66. We suggest that he inquires of the local authority the reason why the one-sixth allowance is being withheld.

LETTERS, NOTES, ETC.

VALUE OF LEGUMES IN BERI-BERI.

DR. B. G. EDGE (Singapore, S.S.) writes: May I offer a few personal observations as corroboration of the conclusions of Dr. Wills as to beri-beri in your issue of June 12th, p. 816? As surgeon on one of the Eastern Extension Telegraph Company's cable ships I had, on two occasions, to deal with an outbreak of subacute beri-beri among the crew (Malay and Chinese). The symptoms in these cases were very slight, being mainly confined to weakness and anasarca of the lower limbs. Indeed, they were so slight that at first the men disdained to notice them, saying they were merely "kechil" (little) beri-beri. Owing to the rice shortage at the time, their diet was mainly highly polished rice. The only treatment that was found necessary was the stopping of the polished and the substitution of unpolished rice—the addition of a free supply of native-grown kachang hijau (a mixture of green peas and beans in the husk)—and an insistence on their living in the open on deck. Within seven days the whole of the symptoms had disappeared, and the men were all on duty. An interesting feature in the district in this connexion is the consumption by the Malays of quantities of kachang goring, procured from native vendors. These are merely ground ("monkey") nuts fried in animal fat. On inquiry I found they were taken largely as a guard against beri-beri.

LEFT-HAND DRIVES.

LIEUT.-COLONEL F. P. MAYNARD, I.M.S. (ret.) (Crewe), writes: Mr. Massac Buist's suggestion that "henceforth no cars may be imported into, assembled, produced, or placed upon the market for service in this country with left-hand drives, but that those which are in private ownership (or already imported, it should be added) at the time of such a regulation may continue to be used" is commendable, and would meet the situation. It has already been adopted in Calcutta, where the police refuse to license any left-hand driven car. Some cars imported before the issue of the order are still allowed to be used. An order of this kind does away with injustice to present owners and importers.

RATS AND PLAGUE.

DR. J. GRAY DUNCANSON (Hove) writes: In reference to the letters of Lieut.-Colonel Cobb and Sir John Tweedy, it may be of interest to record that in 1905, at Jaffa, I was allowed to see the collection of antiquities belonging to a German, Baron von Bunsen. In his private museum, situated in a small building at the back of the principal hotel, he showed me a votive offering, the design of which completely mystified him till I suggested that it would appear in its time to have pointed to some mysterious relation between the rat and plague. It was of bronze, about 10 in. long; when looked at from above it represented very clearly the back of a rat, but both sides revealed human faces in profile with enormous glandular swellings.

FEES OF COUNTY COUNCIL LECTURERS.

"A MEMBER" writes: Having been asked by the London County Council if I am free to accept engagements to lecture and examine for them as before, I intend to reply that I am willing to do so if the fee of £1 1s. is raised to £1 11s. 6d., and would ask other members to do the same. The L.C.C. have raised the fees all round, to their dentists and anaesthetists, as well as for all their teachers, and I think it is not unreasonable for lecturers and examiners to expect an advance, as the work takes up a considerable amount of time.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 33, 36, 37, 38, and 39 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 34 and 35.

THE following appointments of certifying factory surgeons are vacant: Shefford (Bedford), Sleaford (Lincoln), Wombwell (York).

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	7	6
Each additional line...	0	1	3
Whole single column	6	0	0
Whole page	16	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.